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THE NATURAL GAS INDUSTRY

HEARING

BEFORE THE

SUBCOMMITTEE ON ANTITRUST AND MONOPOLY

OF THE

COMMITTEE ON THE JUDICIARY
UNITED STATES SENATE

NINETY-THIRD CONGRESS

FIRST SESSION

PART I

COMPETITION AND CONCENTRATION IN THE NATURAL GAS INDUSTRY

JUNE 26, 27, AND 28, 1973

Printed for the use of the Committee on the Judiciary

(Pursuant to S. Res. 56, Sec. 4)

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THE NATURAL GAS INDUSTRY

(Competition and Concentration)

TUESDAY, JUNE 26, 1973

United States Senate,
Subcommittee on Antitrust and Monopoly
of the Committee on the Judiciary,
Washington, D.C.

The subcommittee met at 10 a.m., in room 1202, Dirksen Senate Office Building, Hon. Philip A. Hart (chairman of the subcommittee) presiding.

Staff present: Charles Bangert, general counsel; Bernard Nash, assistant counsel; Janice Williams, chief clerk; Patricia Bario, editorial director; Peter Chumbris, minority chief counsel; and Charles Kern II, minority counsel.

Senator Hart. The committee will be in order. Permit me a brief opening statement and then we will want to welcome Congressman Brown. These hearings will be characterized in many ways. They are a look at competition and concentration in the natural gas industry. They are an effort of Congress to apply antitrust principles to a significant segment of our economy. But during these next 3 days, it also will become clear that we are basically in the process of evaluating the impact governmental regulations, as practiced by the Federal Power Commission, have had on the natural gas market. Because I have been critical of the FPC over the past 3 or 4 years on many occasions, it would be impossible for me now to assume a role of total impartiality.

Senator Kefauver, my predecessor as chairman, a strong critic of regulatory agencies, pointed out that too often the regulators became regulated by those they were supposed to regulate. In recent weeks, the Senate has spent a great deal of time on this question as it relates to the Power Commission. The upshot was that the Senate refused to add to the Commission another member whose ties to industry were evident from his previous employment. The integrity of that nominee was never questioned, nor could it have been doubted. Nor is the integrity of any member of the Power Commission doubted. But, I believe, regulators, and perhaps it is in the nature of the business, tend to see things much as the industry does.

This impression has been reinforced in recent days because of preliminary reports from staff on the ongoing investigation of the attempts to destroy Power Commission documents which the subcommittee had requested. One point in that report has been particularly upsetting: That over and over members of the Power Commission staff have cited their duty as "to get the price high enough so there is natural gas in the pipeline" without any expressed interest in determining whether the shortage is real or contrived or whether the gas is being deliberately withheld to force the granting of higher prices.

Ironically, the Natural Gas Act, which assigned duties to the Commission, took exactly the opposite approach. The language there is that the Commission is responsible for getting the "lowest reasonable prices" for consumers. Also spelled out firmly in that act is the requirement that the Power Commission go to great lengths to determine the available supply of natural gas.

Yet, for years the basic information the Commission had on the natural gas supply was that compiled by an industry trade group. In recent months two "reports" have been released by the Commission which seem to indicate the industry figures overestimated the supply and the situation is far worse.

The subcommittee has supenaed the basic data for one of these reports, and that information is due here today. The disposition of treatment of the subpenaed documents is a decision to be made later. The other report, called the National Gas Reserves Study, done as part of the National Gas Survey, will be the topic of considerable testimony. Initial interviews with these witnesses have raised serious questions about the value of these studies as a means of verifying the reliability of the industry figures.

We will receive other information from the Trade Commission about its preliminary conclusions as to the validity of the industry's estimates of gas reserves. This information comes from documents subpenaed as part of an investigation undertaken about 30 months ago at the request of the subcommittee. Testimony about the amount of gas reserves is particularly significant, for the shortage is the keystone of recent actions the Power Commission has taken which ultimately will raise prices to consumers by hundreds of billions of dollars by the early 1980's.

The Commission apparently has made three basic policy decisions. There is a shortage. It is not contrived. This is a competitive industry so prices can be set by free market forces, regardless of costs.

This quadrupling of prices will increase supply, the Commission argues. The Commission may indeed be right on all three, but information we have seems to point in the other direction. As I have said, we will probe the shortage question. We also—as is our specific responsibility—will probe the structure of this industry.

And the answer to the third promise will be determined largely from the first two conclusions. There certainly is evidence, including some from a table supplied by the Commission, that this is far from a competitive industry.

That table shows that in southern Louisiana, for example, an area which produces one-third of the country's natural gas, four companies hold 96.9 percent of all uncommitted reserves. It must be remembered that in discussing this industry, national concentration figures are not relevant.

The buyer in the natural gas market is the pipeline. And pipeline companies, obviously, can only buy product from areas in which they have lines. That there are 20 companies controlling 94 percent of the product nationwide is irrelevant if there are only 4 or 5 possible sellers where the pipeline is buying.

Similarly, aggregate concentration figures for all flowing gas are largely irrelevant. In discussing whether this is an industry where competitors are out beating the bushes for customers, two things must be kept in mind. When you are talking about natural gas producers you are talking in effect about the petroleum industry, for they are virtually one and the same. Second, one must remember the mutuality of interest these companies have. Concentration figures really may overstate the amount of head-to-head competition to be expected, for they do not measure the intermingling and interdependence of producers because of consortiums, joint operating and marketing arrangements, joint bidding and substantial trading of products and large tracts of land.

Indeed. the industry is very much like a family, and could well be expected to behave as individuals so as to protect the interests of all. So, it would seem, to allow prices to be set on the premise that free market forces are at work in this industry is to ignore reality.

These hearings will seek fuller understanding on this and related concerns. These hearings will not detail the circumstances surrounding the attempted destruction by Power Commission personnel of uncommitted reserve data filed by major producers and other material requested by the subcommittee.

The staff has interviewed seven Power Commission employees and has received a small amount of documentary evidence. The subcommittee subpena, returnable today, should provide the bulk of the documentary evidence needed from within the Federal Power Commission. Staff informs me that many more persons will be interviewed, and that completion of their investigation will take considerably more time. At that time, the subcommittee will decide what further action may be needed.

[The following letters. in relation to Senator Hart's opening statement. were received for the record. Testimony resumes on p. 14.]

UNITED STATES SENATE,
SUBCOMMITTEE ON ANTITRUST AND MONOPOLY,
COMMITTEE ON THE JUDICIARY,
Washington, D.C., April 27, 1972.

HON. KENNETH F. PLUMB,
Secretary, Federal Power Commission,
Washington, D.C.

DEAR MR. SECRETARY: Rarely do I feel compelled to adopt the role of "interested persons" invited to file comments on proposed Commission rules. However, because the FPC proposal for an "optional procedure" in approving prices for new natural gas at the wellhead threatens such economic harm for consumers, these views are being filed.

I have read the proposed rule, reread it, and consistently come to the same conclusion: if the rule were adopted, the FPC would be abolishing regulation of wellhead prices for new gas. It would do so at a cost of billions of dollars to consumers from this year forward. It would be a step taken before sufficient information is available for a decision. It would be a decision which is not only expensive but impotent for its chosen work—to get a greater supply of gas. And—it is a step beyond the authority of the Commission.

It is true that the "optional procedure" does provide that the FPC will consider contract prices arrived at by the producers and the purchasers—primarily pipeline companies—and could reject them. However. it seems that about 100 times out of 100, the Commission would approve the agreed-upon contract price irrespective of costs and area rate ceilings because of the real fear of losing the gas for the interstate market.

In its effects, the rule seems to parallel the "file and use" rules which some states have adopted for auto insurance. To my knowledge, under this system no premium filed has been rejected.

So, adoption of this rule would approach telling producers that the sky's the limit for prices. The only possible downhold on prices would be the pipeline companies. Because they pass all costs on to consumers, it is unlikely pipelines can be counted on to be the tough protector of family budgets consumers thought they had in the FPC. There are two other flaws in the rule, as drafted. First, it does not provide for a rebate if later we learn that the natural gas shortage used as a defense of higher prices is more imagination that reailty. In fact, the language specifically forbids a refund if the Commission itself should at a later date disallow the agreed-upon higher prices.

Worse, this rule binds all future Commissions to uphold the prices. This is precisely what the "sanctity of contract" bills—which have not been approved by Congress—seek to give the FPC authority to do.

Let me explain why this proposed rule is too costly to consumers, ineffective, untimely and beyond the authority of the Commission.

COSTS TO CONSUMERS

We can project the future under this rule, in a way, by looking to the past.

In 1954 [1] the Supreme Court spelled out the need for producers to be under price regulation because of the inability and failure of the market as structured to provide competitive prices for interstate gas supplies. A review of contract prices for the eight years before the decision (1945–53) shows an overall increase of 300 percent with an average annual price increase of more than 18 percent. [2]

It is the safest of assumptions to say that prices are not going to stay at their present levels if this proposed rule is adopted. Consumers can expect more price increases—piled on the many they have had in the past three years.

According to FPC figures, the price paid for gas in interstate commerce at the wellhead (approximately three-fourths of all gas used) has increased from 17.75 cents per 1,000 cubic feet in 1969 to 19.75 cents in 1971. Even more meaningful to consumers is the price local distributors pay pipeline companies. In two years, those have increased on the average from 36 cents to 43 cents—or 20 percent. If you go back three years, the increase has been more than 25 percent.

Only pennies some might say. But a homeowner with a bill in 1969 which ran in the $30 range in the winter months can tell you that pennies count up as he now receives bills more in the $40 range.

And nationwide, those pennies add up to a lot of money. For example, the total U.S. marketed production in 1971 was approximately 22 trillion cubic feet. Assuming that the same price factors applied to intrastate gas (and it is a sound assumption because intrastate prices are higher), consumers pay more than $200 million annually for each penny of increase. Thus, using again the total marketed production, the 7 cent increase for pipeline sales from 1969 to 1971 cost consumers about $1½ billion while at the same time the volume of gross additions of gas have continued to decline.

It should be noted that while higher prices are making consumers poorer for years to come, they are making the companies richer—and not all of it comes from sales.

There are vast reserves not yet committed to the interstate market and thus without a price yet put on them. Any increase in rates automatically increases the reserves' value. If we estimate the uncommitted reserves at a very conservative 1,000 trillion cubic feet, a one-cent increase lifts their value by $10 billion.

The industry has made no secret of the fact that they feel natural gas prices must go up. In fact, the Independent Petroleum Association of America has suggested that wellhead prices of new gas should, under optional pricing, be equal to prices of alternative supplies—such as liquified natural gas.

To reach that goal, the industry would be asking consumers to pay increased costs of $750 billion.

That deregulation of wellhead prices for new gas would force prices up is evident from the fact that the market simply cannot function as a regulator. The infirmities of relying upon contract price as a regulatory proxy has been noted both by the Supreme Court and the Commission itself over the years.

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[1] *Phillips Petroleum Company* v. *Wisconsin*, 347 U.S. 672 (1954).

[2] The Natural Gas Industry, 1961, Edward J. Neuner.

My views favoring freely competitive market forces and supply and demand to set price as contrasted with economic regulation need not be reiterated here. But we are not dealing with a sector of the economy that by any stretch of the imagination can be said to be responsive to market forces. Absent a restructuring and deconcentration of oil and gas producers and of pipeline companies, it is sheer hypocrisy to suggest that the disciplines of the marketplace will produce price and other behavior in the public interest. Even assuming such a restructuring, complex interactions must be carefully analyzed before firm conclusions can be reached. Deregulation would still then be manifestly a legislative prerogative; not administrative rulemarking.

In the Commission's Permian Opinion (Docket No. AR61-1), the issue was validation of contract prices as a basis for regulation—which the Commission held "would amount to an abdication of our regulatory responsibility." [3] And the Commission noted that the marketplace was not capable of being a regulator:

> "The essential difficulty with the contract price argument is that there is nothing in this record which would justify a conclusion that reliance on contract prices unrelated to cost will 'afford consumers a complete, permanent and effective bond of protection from excessive rates and charges,' which is the purpose of the Act in prescribing that the rates and charges to consumers of natural gas should be just and reasonable. . . . There are admittedly many producers selling gas to the interstate pipelines both in the nation as a whole and the Permian Basin in particular, but nothing in this record suggests that any competition among them in making sales to the pipelines is in any way adequate to assure that the public will secure gas at just and reasonable prices in the absence of regulation."

The Commission went on to note the weak bargaining position of the pipelines—as well as their lack of incentive to do so because they pass on costs—including gas costs—to the consumer.

But there is a point of the Permian case far more significant as we face this proposed rule—which would return us to contract prices rather than costs as the price determinant. This is that the Commission and the Supreme Court held in Permian that this method of establishing prices was not effective regulation. The Commission relied upon an earlier case to indicate that the evidence of unregulated price in the field was not sufficient to warrant a finding that the price could be construed as just and reasonable within the meaning of the Natural Gas Act.[4]

In another court case relied upon by the Commission in Permian, they said:

> . . . that the supply of gas controlled by the producers is so restricted in relation to demand that they have economic power to bargain for prices that will be injurious to the public. The Court held that the Commission in exercising its authority may not act merely upon proof that the prices in question were arrived at as a result of arm's-length negotiation, but must look behind the negotiated price.[5]

The Commission concluded with an unqualified rejection of the use of contract prices as a basis for regulation as follows:

> It is thus clear that our examination of the contract prices of the gas producers is only the beginning and not the end of our task in establishing the proper criteria for determining just and reasonable rates.

In the Supreme Court's affirmance of the Permian decision the lack of a reasonably competitive market was recognized:

> The field price of natural gas produced in the Permian Basin has in recent years steadily and significantly increased. These increases are in part the products of a relatively inelastic supply and steeply rising demand; but they are also symptomatic of the deficiencies of the market mechanism in the Permian Basin.
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> . . . the price leadership of a few large producers, and with the inability or unwillingness of interstate pipelines to bargain vigorously for reduced prices, have created circumstances in which price increases unconnected with changes in cost may readily be obtained.[6]

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[3] Opinion No. 468, issued August 5, 1965.

[4] *Public Service Commission of New York* v. *FPC*, 287 F. 2d 146 (CADC, 1961), *United Gas Improvement Co.* v. *FPC*, 287 F. 2d 159 (CA10, 1960).

[5] *United Gas Improvement Co.* v. *FPC*, 290 F. 2d 133, 135 (CA5, 1961), certiorari denied 368 U.S. 823 (1961).

[6] *Permian Basin Area Rate Cases*, 390 U.S. 747 (1968).

The unreliability of contract prices was reiterated in the 1968 South Louisiana Opinion when the Commission said:

> Based upon this analysis we must conclude that there are serious market imperfections which preclude us from relying upon the free operation of the market, as evidenced by arm's-length bargaining, to protect the ultimate consumer from unreasonable purchased gas rates.[7]

The Opinion held that the conclusion on the unreliability of contract prices for regulation was consistent with a long line of judicial determination.[8]

Obviously the proposed rule would switch us back to a method other than costs and area rate ceilings—a method which was once discarded as unworkable, too costly and not effective regulation.

Moreover, it would do so without gaining the benefit for consumers it seeks—a greater supply of natural gas for interstate sale.

INEFFECTIVENESS OF THE RULE

The argument for eroding consumer protection—in this case price protection—is that it is necessary to protect the consumer in another way. That is, by enabling him to continue to heat or cool his home, cook his food and generally make good use of the dependable servant natural gas has become.

The carrot of price increases—it is argued—must be held out before producers will be enticed into looking for more gas.

This theory has been tried—although in smaller doses—and has thus far failed.

The step-by-step erosion of consumer protection can be exemplified by the following recent Commission action:

(a) Even though the Permian Basin Opinion was decided in 1965, the Commission has granted El Paso pipeline continuous extensions of time postponing any flow-through of Permian producer refunds to consumers.[9] Thus, consumers have not yet and will probably never receive the refunds due them for overcharges. In the second South Louisiana area proceeding (Opinion No. 598) and in the Texas Gulf Coast proceeding, the Commission rescinded prior Commission orders that consumers be refunded more than $375 million for overcharges.

(b) In Opinion No. 567 (issued October 3, 1969), the Commission revised its area rate policy so as to include underlying acreage already committed to the interstate market under its new price definition rather than the lower old price category. These higher rates will result in greater costs to the consumer because the Commission has abandoned the life of reserve concept.

(c) In Opinion No. 568 (issued October 7, 1969), the Commission abandoned the cost of service approach to new gas which was to be produced by pipeline companies. While the D.C. Circuit affirmed area pricing for pipeline production from newly acquired leases, they had reservations concerning whether the pipeline should earn the same rate of return as gas producers, as well as the treatment of the Federal income tax component of area rates to be applied to pipeline production. Here again, the Commission resolved the issues without adequate consideration of the cost to the consumer.

(d) In Order No. 394 (R–374) issued January 6, 1970, the Commission amended its regulations to permit small natural gas producers in the Permian Basin to file above-ceiling rate increases. Under the earlier Permian Opinion small producers operating under small producer certificates had been proscribed from filing contractually authorized above-ceiling rate increases. When the Commission increases the Permian rates, this will permit the producers to collect a higher rate for the period prior to that determination.

(e) In order No. 413 (R–394), issued October 27, 1970, the Commission terminated the moratorium on rate increases in South Louisiana which was imposed by Opinion Nos. 546 and 546–A. They did this despite the urging of the Wisconsin Public Service Commission and the Municipal Distributor Group that the Commission should not lift the moratorium on the basis of industry supplied data which had not been tested in an evidentiary hearing. In a later order (issued December 24, 1970), the Commission modified Order No. 413 to limit the rate increase filings to the settlement proposal. This despite the fact that the settlement proposal had not been adopted and was the subject of controversy among the various parties.

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[7] *South Louisiana Area Rate Proceedings*, 40 FPC 530 (1968).

[8] See, *Bel Oil Corp.* v. *FPC*, 255 F. 2d 548 (CA5, 1958), *cert. denied* 358 U.S. 804; *City of Detroit* v. *FPC*, 230 F. 2d 810 (CADC, 1955); *Forest Oil Corp.* v. *FPC*, 263 F. 2d 622 (CA5, 1959); *Atlantic Refining Co.* v. *PSC of New York* (CATO), 360 U.S. 378 (1959); *UGI* v. *FPC*, 283 F.2d 817 (CA9, 1960); *PSC of New York* v. *FPC*, 287 F. 2d 146 (CADC, 1960); *UGI* v. *FPC*, 287 F. 2d 159 (CAIO, 1961); *UGI* v. *FPC*, 290 F. 2d 133 (CA5, 1961), *cert. denied* 368 U.S. 823; *UGI* v. *Callery Properties, Inc.* 282 U.S. 223. For the most recent opinion of the Supreme Court on the subject see *FPC* v. *Sunray DX Oil Co., et al.* 391 U.S. 9, 25–26 (1968).

[9] 44 FPC 1215 (1970).

(f) In Order No. 423 (R–407), issued February 18, 1971, the Commission adopted a general policy of suspending producers rate increases for one day rather than for a full statutory five-month period provided in the Natural Gas Act. The New York Public Service Commission petitioned for a court review on the basis that the order was inconsistent with the statutory scheme of the Natural Gas Act and protested that the order modified outstanding suspension orders without any consideration of the increased rate, contract vintage, or other factors involved in the particular cases. In addition, they objected to the granting of a blanket waiver of conditions in temporary certificates prohibiting the filing of rate increases to contractually authorized levels. On April 11, 1972, the U.S. Court of Appeals remanded Order 423 to the Commission for the purposes of clarification.

(g) On March 18, 1971, the Commission issued Order No. 428 (R–393) amending its regulations so as largely to exempt small producer sales from regulation. This applies to jurisdictional sales which do not exceed 10 million Mcf in a calendar year. The Commission provided that small producers, after obtaining a blanket certificate covering all existing and future sales nationwide, thereafter will be relieved of all filings under the Natural Gas Act. The only obligation was for them to file an annual statement providing total jurisdictional sales and applications to abandon under Section 7(b).

(h) Under an emergency purchase procedure, the Commission issued Order Nos. 402 and 402–A, dated May 6, 1970 and June 30, 1970, respectively, in which FPC regulations were amended to permit interstate pipelines to make emergency purchases of gas from intrastate pipelines for 60 days or longer without affecting the exempt status of the seller companies. Order No. 418, issued December 10, 1970, amended the regulations to permit independent producers without certificate authorization to make emergency sales to pipelines for periods limited to 60 days where serious curtailment problems existed. These emergency purchases were made at rates substantially above ceiling and as high as 35 cents per Mcf.

Yet today—after all these plums for the industry—we find ourselves not with an increase of reported reserves but with steadily dwindling reported reserves.

During the past two years, as a result of FPC decisions, total gas prices have increased markedly; and during that time decreasing quantities of proved reserves have been reported and a decreasing proportion of gas has been made available to the interstate market.

Indeed, we find no evidence of any substantial increase in private investments in exploration and development during this period of increasing rates by the FPC. The logical explanation for the increasing prices and declining commitment of reserves is simply that the producers are banking on decontrol and still higher prices or, in the alternative, higher prices in the future under the guise of regulation.

In his letter of April 14, 1972, to me Chairman Nassikas said in reference to these actions:

> The actions taken by the Commission over the last two and one-half years cannot immediately reverse the downward trends of more than a decade because of the lead time required for exploration and development prior to the flow of significant quantities of gas to the interstate market.

Yet, without permitting time to see whether the hoped for effect of these actions work, we are now ready to embark upon a new round of price increases.

It is also hard to imagine that deregulation would result in greater exploration and development, hence greater reserves, than would otherwise exist under *firm* and fair area rate pricing. FPC's area rate proceedings, as explicated in its most recent Southern Louisiana decision, provides for a costing to recover all expenditures associated with the cost of exploration, development and production of natural gas, including a return. Thus, whatever costs must be incurred to find and produce an adequate supply of natural gas will be recovered from the consumer. In South Louisiana, the return afforded the producers by FPC amounted to 15 percent. It is difficult to believe that *all* costs plus a 15 percent return is not an adequate incentive to bring forth necessary supplies. It can only be concluded that other reasons associated with natural gas market imperfections exist for the shortage. Moreover, given the area rate costing procedure and the 15 percent incentive return, it is impossible to perceive how deregulation will result in any increased supplies. To the contrary, only increased prices are perceived from deregulation.

There is nothing inherent nor specific within the Commission's proposal to assure that additional gas will be made available for the consumers of the country which would not have been committed under its area rates. No guidelines or mechanisms are even discussed to show the relationship between the proposed rule and greater supply.

It should be clear that we have been applying the wrong medicine. Instead of deciding to give it one last shot—in a massive dose—we should find another medicine.

UNTIMELINESS OF THE RULE

I recognize—as does the Commission—that natural gas is presently unavailable in sufficient quantities to meet requirements.

We all know that this is creating problems for consumers. And the Commission does have the responsibility to do all in its power to see that consumers have sufficient natural gas.

However, I am convinced that with this rule, the Commission is regulating in the dark. It does not have sufficient information to evaluate if there is a true—or a contrived—gas shortage. Nor does it have solid evidence that increasing prices is the way to correct that shortage. In fact, as has been outlined, past steps in that direction have been dismal failures.

The only information available to the Commission as to the shortage of gas comes from the industry—which would benefit enormously by price increases. Attempts are being made to evaluate the validity of these industry figures.

As you know, the Federal Trade Commission is conducting an investigation of the validity of the American Gas Association reserve estimates. The National Gas Survey, being conducted by the FPC and the industry, is also reviewing reserve estimates. And, S. 2405 is designed to require an independent FPC reserve study. Only recently has any governmental authority had access to AGA field by field reserve evaluations, and this was in connection with the present FTC investigation.

The available evidence indicates that reserves may well be adequate; but if producers wish to, they may make the picture far more dismal than it truly is.

It is imperative for the Commission to focus on independently obtaining more reliable and objective information which will permit it to quantify costs of producing gas in the various areas and strengthen the area rate approach in order to balance consumer protection with industry equity. Independent reserve estimates are essential not just as a measure of resource availability, but because it is an essential ingredient in costing new gas. If the consumer is to be afforded the protection against excessive costs which translate to excessive prices—even in area rate proceedings—then reliable reserve data untainted by industry self-interest is vital for the costing calculation used in area rate proceedings.

The staff study cited in Docket No. R–441 as a basis for contending a serious shortage exists indicates the resource basis which could effectively overcome the present unavailability.[10] The potential volumes available as estimated by the U.S. Geological Survey (adjusted for discoveries) is 2,061 tcf (trillions of cubic feet) and by the Potential Gas Committee, 1,178 tcf. Some of the important characteristics of the natural gas producer market which provides potential instability are:

A. The producers have complete flexibility to determine when to offer their reserves for sale as well as whether to offer the gas interstate or intrastate.

B. A very small price change has major revenue implications on the value of reserves in place.

C. A relatively small increase in consumer demand has a magnified effect on the demand for new gas reserves because only a small fraction of each year's supply becomes available to new buyers, and the major portion of the reserves is already committed under contract.

D. Given the present demands by pipelines for gas, which has been significantly affected by air pollution considerations, there would be a tendency for them to preempt reserves well in advance of their immediate

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[10] *Natural Gas Supply and Demand,* 1971–1990, Bureau of Natural Gas, FPC, February 1972, page 13.

> needs, particularly because they can include take or pay obligations in their rate base, not to mention their ability immediately to pass the cost on to the consumer because of tracking provisions allowed by the Commission.

Additions to domestic reserves to be anticipated from present and future technology are far from insubstantial as exemplified in just one producing area:

> As the evidence disclosed a drastic decrease in the ability of domestic supplies and reserves to meet increasing demands in the short time since the 1967–68 hearings, so also does the evidence disclose the possibilities of a very substantial increase in domestic supplies and reserves.
>
> The evidence reveals that the domestic areas which have traditionally served to supply the Western United States have a gas supply potential of 180.5 trillion cubic feet (TCF), almost four times their present proved reserves. The Bureau of Mines has estimated that 317 TCF are contained in formations along the Rocky Mountains which may be susceptible to recovery by nuclear stimulation. It is estimated that recoverable coal reserves in the United States contain a potential of 12,000 TCF of synthetic pipeline gas and that the processing of oil shale reserves in Colorado alone would yield about 6,000 TCF of pipeline gas (FPC staff Exhibits 1000 and 1006). In addition to the potential domestic gas supplies and reserves, Western Canada and the Arctic Islands have a potential of over 530 TCF, (El Paso Exhibit 120 Page 17) and Alaska's estimated potential is about 420 TCF. (Staff Exhibit 1000 Page 3). *United States* v. *El Paso Natural Gas Company*, U.S.D.C. Denver. (June 25, 1971).

Imposition of deregulated prices on the consumer for future reserves of this magnitude would be a national scandal.

THE COMMISSION IS ACTING OUTSIDE ITS AUTHORITY

Much of my feeling on this point already has been developed. It is clear from the Natural Gas Act as interpreted, that the Commission does have the responsibility to regulate prices on a cost basis in this industry. The Commission—and the Courts—long ago decreed that agreed-upon contract pricing, which this rule reestablishes, is not effective regulation.

Congress has previously considered deregulation but the Natural Gas Act has not been amended. Other legislative solutions to the present problem are now being considered. It seems clear to me that the proposed Commission action is an ill-advised incursion upon the legislative function.

Further, while the Chairman and Commissioner Brooke have petitioned Congress for the authority to grant sanctity of contract and the Commission has endorsed other sanctity of contract bills, it now proposes with this rule to act as if it already had such authority.

CONCLUSIONS AND RECOMMENDATIONS

Even if the Commission should decide that deregulation of price is a proper step—and that it has the authority to take this step without legislative approval—R–41 is not the appropriate vehicle.

The Commission's own brief to the Court, indicates the present curtailment problems interstate pipelines now face.[11] Apparently 7 pipelines are now in curtailment with applications pending before the Commission from 26 more.

Given this shortage—and the fact that it would take one to five years to get new product on the market no matter what the price—a sudden and total deregulation of new gas price without more could only raise havoc.

Actually, the one to five year lag for adequate supply to hit the market is optimistic. For once deregulation is effected, companies would be in a position much like a stockholder in a bullish market. Knowing that a contract commitment will be for 20 years, they will be tempted to hold out supply until the price has peaked. Of course, since they control supply, the longer they hold out the greater the price level which can be anticipated.

Pipelines would bid against one another—skyrocketing prices even higher than the point they would eventually level out at with adequate supply. The result would be adequate supply for some consumers—at totally unrealistic prices—and even a greater reduced supply for other consumers.

If and when deregulation of price seems the proper step, it seems wisest to take that step gradually—with built-in assurances that the available supply will be parcelled out fairly to all consumers.

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[11] *Michigan Power Company* v. *FPC*, CADC, No. 71–1752, April 10, 1972.

The road to getting more gas for consumers is not barred if the FPC should—as I urge they do—reject this proposed rule. There are alternative steps.

For openers, the Commission should insist that the 46 natural gas producers that agreed to the South Louisiana settlement (who produce 80 percent of the gas flowing from that area) live up to their obligation.

Section 11 of that settlement relating to future exploration and development in the Southern Louisiana area states:

> Each producer individually represents to the Commission that the ceiling prices and other provisions contained herein provide incentive for the exploration for and development of gas reserves in the Southern Louisiana Area.

The settlement continues:

> . . . it is believed that the ceiling prices and other provisions contained herein will make funds available to the producing industry and create a regulatory atmosphere which should provide an incentive for a substantial increase in exploratory and developmental activities and make a major contribution to bringing forth additional supplies of gas from the Southern Louisiana Area to meet the demands of all consumers supplied by this area.[12]

Presently, there are pending several Congressional studies on the cause of and possible remedies for the present shortage of natural gas. Because I believe that action of the kind taken in the proposed rulemaking is the function of the legislative process—and not administrative rulemaking—I urge full support for this work underway in Congress.

Further, rejection of this rule may have a salutory effect on the industry. As the recitation of the plums granted the industry in the past three years indicated, companies understandably have gotten glorious expectations that prices will continue to go up and up. Essentially, they are not convinced that current ceiling prices will hold, and R–441 is additional evidence that this expectation is realistic. With that impression, they have had little incentive to be quick about committing reserves, little incentive to hold down costs and little incentive to make the necessary commitment to substantial gas exploration and development. Positively stated, producers have an incentive to withhold new supplies particularly if they can foresee that the Commission will raise ceiling prices. It is to their benefit to exaggerate the shortage, and sellers have an incentive to distort or withhold information for tactical reasons.

A firm stand at this time on prices by the Commission may turn this situation around considerably.

In short, I petition the Commission to withdraw this proposed rule on the grounds that it will be too costly to consumers, will not do the job of upping supplies, and is not well-founded in the facts as we now have them.

Instead, the Commission should reaffirm its reliance on the area rate approach and inform the industry that no longer will it be party to violation of that cost-based area pricing framework.

This philosophy should be stated not only with the turndown of the rule but reiterated continuously by the Commission.

Meanwhile, efforts to determine exactly how we stand on natural gas reserves should be continued; and we should explore alternative methods of increasing the supply—if need be.

In cooperation with the Department of the Interior, the Commission could seek new policies to accelerate gas production from federal offshore leases with appropriate environmental safeguards.

Also worthy of serious consideration is establishing a government corporation to explore and develop some of the oil and gas deposits on public lands. Another is to eliminate the jurisdictional distinction between gas sold in the interstate and intrastate markets.

All of these, it seems to me, are reasonable possibilities which could well serve the public—something R–441 definitely would not do.

Sincerely,

PHILIP A. HART, *Chairman.*

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[12] Opinion No. 598, issued July 16, 1971.

CONGRESS OF THE UNITED STATES,
JOINT ECONOMIC COMMITTEE,
Washington, D.C., May 12, 1972.

Re Optional Procedure for Certificating New Producer Sales of Natural Gas, Docket No. R-441.

Hon. KENNETH F. PLUMB,
Secretary, Federal Power Commission,
Washington, D.C.

DEAR MR. SECRETARY: On April 6, 1972, the Federal Power Commission issued a notice of proposed rulemaking preparing an "optional procedure" for fixing wellhead prices of natural gas. Interested persons were initially afforded until May 1, 1972, to file comments. This was subsequently extended to May 15, 1972.

Essentially, the optional pricing procedure provides that whatever contract price for gas is arrived at between the producer and the purchaser (primarily pipeline companies who pass the cost of gas on to the consumer as a cost of service) will be considered for permanent certification by the FPC and presumably adopted irrespective of costs and area ceiling rates. This is tantamount to administrative deregulation of wellhead prices for new gas in clear defiance of the Congressional intent underlying enactment of the Natural Gas Act of 1938.

Additionally, under the terms of R-441, once a contract is approved it would be binding for all time. Future commissions would be powerless to change the prices regardless of then existing regulatory needs and irrespective of then existing circumstances; i.e., monopoly or excessive profits, new found natural gas reserves or additional reserves from new technology. The latter provision provides administratively for what has been termed "sanctity of contract" in several bills now pending before the Congress. To our knowledge, Congress has not yet acted on the pending "sanctity of contract" legislation.

We feel compelled to file comments and put the Commission on notice because the Commission's action is such a blatant and arrogant usurpation of the legislative function by administrative rulemaking. It is manifestly anticonsumer and pro-industry. Shamefully, it is not predicated on any independent Government verification of natural gas reserves which are reported exclusively by the industry. Nor is there any structural or operational analysis of the industry to independently explore and determine *why* producers are not producing what the relationship between price and exploration and development is, and why recovery of all costs plus a 15 percent return is an inadequate incentive for producers to produce.

Is a 15 percent return inadequate because by failing to produce, producers can force a return of 30 percent, 40 percent or 50 percent? Is the return inadequate because FPC has held out hopes of higher prices as long as producers do not produce? Is the return inadequate because our tax laws are such that an equivalent amount of overseas payments, investments and expenditures results in a greater profit? Is it inadequate because a greater return can be achieved from diversified activities? Would not one solution be a TVA-type entity to explore for and develop natural gas reserves on federal lands?

All of these questions are being explored right now in the Congress. And, after due deliberation, Congress will take action. We welcome discussion with and guidance from the Commission—but we cannot accept administrative action resulting in basic amendments to the Natural Gas Act.

I. PROPOSED RULE WOULD EFFECT AN ADMINISTRATIVE DEREGULATION OF WELLHEAD SALES OF NATURAL GAS

As the Supreme Court has often reminded, the organic statute under which the Federal Power Commission operates—the Natural Gas Act of 1938—was designed to protect this Nation's consumers against excessive rates and charges for natural gas service. To this end, the Act mandated that all gas sold for resale in interstate commerce be sold at just and reasonable rates and specifically directed the Commission to fix interstate rates at the just and reasonable level.

The Act thus mandated a fundamental change in the standard of pricing natural gas moving in interstate commerce—instead of an unregulated, what the-traffic-will-bear standard, the statute required a regulated price permitting sellers to recover their costs and a fair return but eliminating the possibility of excessive profits. This change was premised on a Congressional finding that, absent regulation, the market structure of the interstate natural gas industry would not assure fair prices for the consumer but would, on the contrary, permit sellers of natural gas to exploit their position and charge prices far in excess of the true economic costs of making the sale.

In one form or another deregulation legislation has been introduced in the Congress since 1955. Yet the Natural Gas Act has not been amended.

It is against this background, then, that the standards embodied in the Commission's proposed new rule must be evaluated. What the Commission is now suggesting is that because there is a current shortage of natural gas, the cost-plus-fair-return standard which the Commission has heretofore followed in fixing just and reasonable rates under the Natural Gas Act should be discarded in favor of what the market will bear.

The basic defect in the Commission's proposed approach is immediately apparent, however: the new approach is simply not the regulation mandated by Congress in the Natural Gas Act. Although retaining the form of regulation, the proposed rule adopts a substantive standard for evaluating new prices that is nothing more than the unregulated market price. But if that is to be the standard, it can only be achieved through Congressional repeal of the Natural Gas Act. As suggested above, if Congress had been satisfied that the unregulated market price provided adequate protection for natural gas consumers, it would not have passed the Natural Gas Act—or it would have amended it.

II. Proposed Rule Would Impose Staggering Rate Increases on the American Consumer and Would Permit Grossly Excessive Profits for the Petroleum Industry

Since the industry is, under the Commission's *present* rules, entitled to rates which cover all costs plus a fair return,[1] it is apparent that for the proposed rule to have any effect at all, it must allow prices that include *more* than a fair return. While the Commission's notice provides no indication of how much more is involved, estimates already submitted in this docket indicate that the potential cost to the consumer (and the potential windfall to the industry) could range up to one trillion dollars over the life of the reserves.

Based on the present U.S. consumption of natural gas, each penny of increase in price at the wellhead means $200 million flowing from the pocketbooks of American consumers to the income statements of the producers annually.

Considering that the "optional pricing" in R–441 evolved from the recent Independent Petroleum Association of America proposal that FPC approve contract prices as long as they do not exceed prices of alternative supplies such as imported LNG, which is estimated to cost between $1.00 and $1.25 per mcf, at the present rate of consumption we are talking about higher annual costs in the neighborhood of $15 billion.

Surely before adopting any rule having such far-reaching consequences, the Commission is under a heavy obligation to make the best estimate it can of the potential impact and to advise the public of that estimate. More importantly, the magnitude of the estimates already submitted, which are based on readily understandable assumptions, demonstrates that the proposed policy is simply too costly to the consumer and too generous to the industry to merit serious consideration under a statute designed to protect the consumer. At the very least, consideration of other, less costly methods of achieving the same goal should be undertaken by the Commission and recommended to the Congress.[2]

III. There Is no Evidence To Suggest That the Proposed Rule Will Generate Additional Gas Reserves

Legally and cost aside, there is no credible evidence that the radically higher prices allowable under the proposed rule will result in the dedication of additional gas reserve to the interstate market. To the contrary, the Commission's past efforts to increase the rate of interstate dedications through the grant of higher prices have been wholly unsuccessful, if not counterproductive. Less than a year ago, the Commission, at the industry's urging, approved an industry-sponsored rate proposal, predicated upon the natural gas shortage, increasing price ceilings for the crucial Southern Louisiana area by some 30 percent-40 percent, or about $4.75 billion. Although the Commission's action was taken largely on the basis of the industry's representation that the higher prices would in fact provide the necessary incentive for exploration, the result has been higher prices, but a decline in the rate of reserve additions.

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[1] The Commission currently allows producers a return of 15 percent after taxes.

[2] One such alternative would be for the Federal Government to explore for and develop gas on federally owned lands, where the bulk of new reserves are expected to be found. Such an alternative would meet the Nation's needs for natural gas, with no possibility for excessive prices or excessive profits.

It is shocking that at the same time consumers are absorbing price increases in the billions because of the gas shortage, and are being asked to absorb billions more for the same reason, the major oil and gas producers *refuse* to allow independent Government verification of their reserve estimates. Permit us to quote extracts from three recent Federal Trade Commission communications on this point (the full texts are annexed hereto as Exhibits 1, 2 and 3):

"The Federal Power Commission recently granted producers of natural gas in South Louisiana substantial increases in the rates they may charge pipeline companies. South Louisiana is the principal gas producing area in the country, and the rate increase sets a precedent for other producers. In reaching its decision, the Federal Power Commission relied principally on national reserve estimates published by the American Gas Association (AGA). At the present time the AGA is the only source of estimates of total United States proved natural gas reserves. AGA figures indicated a recent trend of significantly lower gas reserves in the face of increased demand. The Federal Power Commission reasoned that the higher rates were necessary to spur exploration which would result in the discovery of additional reserves.

"The Federal Trade Commission is currently investigating the accuracy of the AGA figures relied upon by the Federal Power Commission. It has not yet been determined whether the AGA figures are accurate. It has been determined that, for the most part, AGA figures are compiled by employees of major oil companies, and that their estimates are based upon company data which heretofore has been unavailable to outsiders, including Government officials.

"The increased rates granted South Louisiana producers involve billions of dollars of revenues. It does not appear unreasonable to require the agency responsible for granting such increases to review and evaluate the source data for the statistics underlying its rate decision.

"In late November, 1971, documentary subpoenas requiring the production of all evaluations of reserves during 1962–1970 for any portion of Offshore South Louisiana, including backup data and well exploration data, were issued to eleven gas producers (most of whom are also major oil producers). These producers account for the bulk of natural gas production in South Louisiana; and employees of nine of these producers constitute the membership of the AGA Subcommittee which evaluates and reports reserves for South Louisiana. All eleven producers have filed motions to set aside the subpoenas on a number of grounds, including lack of jurisdiction to investigate, burdensomeness, and the commercial value of the documents being subpoenaed. One of the eleven, however, has made a partial return and has promised additional cooperation despite its pending motion."

* * * * * * *

"At the outset I wish to reemphasize that my support for S. 2405 or similar legislation is premised on my conclusion that there are reasonable grounds for questioning the reliability of the only existing system for reporting proved natural gas reserves in this country. The facts underpinning that conclusion are simply stated, and I believe they are indisputable."

* * * * * * *

Since the Commission's proposed regulatory approach, as indicated by its notice, is predicated exclusively on the current gas shortage and on means to solve that shortage, it seems clear that, prior to adoption of its proposed policy, the Commission should undertake a far more thorough study of the gas reserve situation than it has to date. Rather than merely accepting industry estimates, the Commission should independently determine the extent and location of presently recoverable reserves, the extent and location of probable reserves, and review and determine the factors, particularly non-price factors, that would influence early dedication of probable reserves to the interstate market. At a minimum, the questions raised in the forepart of these comments should be the subject of a public hearing.

CONCLUSION

Continual Commission statements on the need for higher prices only encourage the holding back of reserves and the curtailment of exploration and development activities until the industry believes it has obtained the highest possible prices.

The proposed rule cannot lawfully be adopted and should be promptly abandoned. Any Commission recommendations for resolution of these matters should be transmitted to the Congress for action.

In the event the Commission intends to implement R–441 in whole or in part, a public hearing is requested prior to such action. If the Commission takes such action, it must also file the required statement of environmental impact and alternatives under the National Environmental Policy Act, 42 U.S.C. 4321 *et. seq.* The proposed action clearly has a major environmental impact, and such a statement is accordingly required by 42 U.S.C. 4332 (2) (c).

Sincerely,

William Proxmire, Frank E. Moss, Gaylord Nelson, Fred R. Harris, Lee Metcalf, Vance Hartke, Walter F. Mondale, Harold E. Hughes, Thomas J. McIntyre, Robert T. Stafford, George D. Aiken, John V. Tunney, Edward M. Kennedy, Birch Bayh.

Senator HART. Mr. Chumbris for Senator Hruska.

Mr. CHUMBRIS. Thank you, Mr. Chairman. The LEAA issue is on the floor today which precludes Senator Hruska from being here this morning. On June 8 when we opened the gasoline shortage hearings I gave a brief or rather long, depending upon how you look at it, opening statement which dealt primarily with the natural gas shortage in the United States.

Being a part of this hearing there is no need in repeating it at this time. Senator Bartlett, on June 12, 1973, made a speech on the Senate floor dealing with the energy crisis. And I will just read one quote and have the complete speech put in the record, Mr. Chairman.

> The time has come for political considerations, regional preferences and personal antagonisms to be set aside. The valuable time and effort being wasted trying to find a scapegoat must cease, and we must be directed toward an all-encompassing effort to improve our domestic energy posture.

He points out that the consumers in his State are paying 60 cents per thousand cubic feet at the wellhead while people in interstate commerce are taking that Oklahoma gas, and are paying only 19½ and 20 cents per thousand cubic feet. He commented that the people of Oklahoma don't mind doing that, if an increase in the price of gas will help exploration and development. With that, Mr. Chairman, Senator Brock had a similar statement in relation to cooperation by the people of the United States—that the States which are consumers should help out by permitting refineries which they are not doing now because of ecological concerns.

Thus, everybody works together toward solving the problem. He pointed out that there is plenty of blame for everybody to pass around.

Thank you, Mr. Chairman.

[The speech referred to follows:]

[From the Congressional Record, June 12, 1973]

THE ENERGY CRISES

Mr. BARTLETT. Mr. President, the energy crisis in America will not be resolved in the near future. For the next 15 years, and possibly longer, the people of the United States must work together with a new awareness of the gravity of this crisis.

The time has come for political considerations, regional preferences and personal antagonisms to be set aside. The valuable time and effort being wasted trying to find a scapegoat must cease and must be directed toward an all encompassing effort to improve our domestic energy posture.

Natural gas produced in Oklahoma in new long-term contracts costs Oklahomans 60 cents per 1,000 cubic feet at the wellhead. Yet the same gas sold out of State would cost the out-of-State consumer only 20 cents per 1,000 cubic feet at the wellhead. Oklahomans pay three times more for Oklahoma gas than do out-of-State buyers. The reason for this is that the Federal Power Commission regulates the price of interstate gas, but intrastate prices in the free marketplace have been bid up in Oklahoma to a price that is competitive with other fuels. Oklahoma wants to share its gas resources, but it also wishes to share its price based on thousands of transactions in the marketplace.

The Oklahoma intrastate gas buyers have an advantage over out-of-State buyers because they can bid higher for gas for Oklahoma consumers.

Yet, when I inquired of Mr. C. C. Ingram, the chairman of the board of Oklahoma Natural Gas Co., as to the effects of interstate deregulation of prices upon this wholly intrastate company, he said:

"We are well aware that decontrol of the wellhead price for natural gas that will be sold into interstate commerce will reduce our competitive edge in acquiring new gas supplies. However, we are even more aware of the need to increase the price for gas at the wellhead in order to stimulate the exploration activities that will be required to develop the gas reserves that are needed to offset the energy shortage. Although decontrol will increase our competition's effectiveness, we believe we will have no great difficulty in obtaining gas supplies to serve our customers through both our continued aggressiveness in gas purchase activities and our significant expansion in our own exploration efforts."

This is the kind of unselfish attitude that must continue to spread across the Nation. Mr. Ingram knows that our country needs price decontrol and looks forward to the increased competition because it will also mean increased reserves of natural gas, oil, coal, and atomic energy. He knows the United States needs a stronger domestic energy industry.

Consumer States must assume a new role. States that heretofore have refused to site refineries, and to explore for oil and gas on their outer continental shelves and to locate deepwater ports must reconsider and move forward with determination to help solve this national crisis.

Consumer States must work with producer States and industry to plan for the onslaught of imports that is inevitable. They must establish facilities to refine these crude imports.

We must start constructing a pipeline to market domestic oil from Alaska in the 48 States.

We must deregulate the price of gas in order to increase the supply of gas, oil, coal, and atomic energy.

We are all in this together. Our outlook must be constructive and objective. We cannot afford to waste time casting the blame. We must roll up our sleeves—there is a job to be done—in the best interest of the United States. We need a strong domestic energy industry.

Senator Hart. The committee now welcomes as its first witness the able Member of Congress from California, Mr. George E. Brown.

STATEMENT OF HON. GEORGE E. BROWN, JR., A U.S. REPRESENTATIVE FROM THE STATE OF CALIFORNIA

Representative Brown. Thank you very much, Mr. Chairman, for the opportunity to be here this morning. I want to commend the subcommittee for undertaking this series of hearings. I personally feel that there is nothing more important to the political and economic future of this country than a thorough investigation of the effectiveness of our institutional system for regulating great economic enterprises, particularly the enterprises that are engaged in the energy field today.

I am sure that the results of your hearings will have substantial impact on that. I am going to read my statement, but omitting certain portions of it, in order to expedite these hearings.

Senator HART. It is so ordered that the statement will be entered in the record in full.

[The statement referred to appears at the end of Congressman Brown's testimony.]

Representative BROWN. Thank you, Mr. Chairman. I testify before you today about my experience with the petroleum industry and the Federal Power Commission. As a member of the Energy Subcommittee of the Science and Astronautics Committee of the House of Representatives, I have become painfully aware that we face a great energy crisis. What I am most concerned about in this regard is the vacuum of leadership and responsibility which has led to an unprecedented energy shortage in this country.

In my judgment this shortage has occurred because leaders in Government and industry have acted to maximize their own short-term interests at the expense of the consuming public. Industry has attempted to maximize its profit, certain public officials have been more interested in serving private interests rather than public needs, and our institutions and agencies have laid prostrate accomplishing little or nothing in our greatest hour of need.

One of the major questions that I want to explore in this testimony is why the Federal Government, and in particular the Federal Power Commission, has failed to act decisively and effectively as our energy crisis has mounted.

For example, the petroleum industry has over the last several years repeatedly asked for and received substantial increases in the wellhead price of natural gas. These price increases have been approved by the Federal Power Commission on the ground that if the price of natural gas is allowed to increase more exploration for natural gas will occur, and the shortage of natural gas will be alleviated.

This argument has proved to be false. The Federal Power Commission has gone along with the petroleum industry permittting the price of natural gas to nearly triple in the last 3 years, and yet if one believes the figures offered by the petroleum industry, the shortage of natural gas has only worsened.

We have been repeatedly warned by both scholars and practical politicians that independent regulatory agencies are in constant danger of being taken over and controlled by the very industries that they are charged with regulating.

I submit to you that recent events and the facts uncovered by both my staff and diligent investigative reporters indicate that this has happened to the Federal Power Commission.

This demise of the Federal Power Commission as an independent and vigorous regulator and planner has permitted the energy shortage to deepen in severity with untold cost to the American consumer.

Recent startling developments have focused attention on the Federal Power Commission and its actions. For example, earlier this month both the Washington Post and the Los Angeles Times reported that certain important documents had been ordered destroyed by officials at the Federal Power Commission after this committee had requested them.

These documents, I am informed, indicate that the shortage of natural gas reserves may not be as severe as the Federal Power Commission and the oil companies claim, and that, incredibly, as much as 80 percent or more of our available uncommitted gas reserves may be controlled by four or five oil companies.

The situation would indicate the existence of classic monopoly power. What has happened that could lead to such extreme conduct by public officials that they would order critical documents destroyed to keep them out of the hands of a congressional committee?

I have been brought to the deeply disturbing conclusion that it is a "Watergate" mentality and that this mentality strikes into the very heart of the regulatory and administrative bodies that deal with the energy crisis.

In an article in the Washington Post of May 13 of this year, entitled "Watergate Reveals Gamey Election Money," Morton Mintz, a widely respected financial reporter, described in detail the penetration of the Federal Power Commission by the oil industry, through what is now a classical political weapon: massive campaign contributions that are difficult, if not impossible, to trace. This article pointed out how William Liedtke, president of Pennzoil United, owner of United Gas Pipeline and gas-producing affiliates, all regulated by the Federal Power Commission, raised $700,000 for the Committee To Re-Elect the President from his friends in the petroleum industry, and had the money flown to Washington 2 days before the Federal disclosure law took effect, thus keeping the contribution secret.

Subsequent to these and other contributions from oil interests, President Nixon appointed two nominees to the Federal Power Commission, and I say here, who favored deregulation of natural gas. Actually, only one of the two is on record as favoring deregulation. Such deregulation would result in massive windfall profits to the oil industry and substantial price increases for the American consumer. These nominees, one of whom has now been rejected by the Senate, would have joined three other sitting Commissioners who also advocate deregulation.

Hence, we have a regulatory commission made up of Commissioners so industry oriented that they publicly advocate that the Commission should give up its function. Instead of enforcing statutes enacted by the Congress, and providing consumer protection against monopoly exploitation, they have chosen to use their high office to undermine public surveillance of the industry, and to serve private oil and gas interests.

Following the Morton Mintz article of May 13, 1973, focusing on the role of William Liedtke, president of Pennzoil United, my staff and I conducted a private investigation of major oil industry connections in the Federal Government. Among our significant findings are the following:

None of these are secret, Mr. Chairman. We merely surveyed the public record. The same William Liedtke of Pennzoil who funnelled $700,000 to the Nixon reelection committee, is reported to have interviewed and offered the Federal Power Commission post to present Commissioner Rush Moody, Jr., prior to his appointment by President Nixon.

Commissioner Moody has now authored the astonishing Federal Power Commission opinion in the widely reported *Belco* case which sets the stage for gas price increases of at least 73 percent at the wellhead and in effect deregulates the price of natural gas by administrative fiat through a procedure termed "optional pricing."

Two, Commissioner Moody, before his Liedtke-Nixon appointment to the Federal Power Commission, was associated with a Midland, Tex., law firm—Stubbeman, McRae, Sealy, Laughlin & Browder—which represents the interests of some of the largest petroleum companies, including but not limited to Texaco, Inc., a party in the *Belco* case, and Mobil Oil Co.

It is astonishing that Commissioner Moody did not disqualify himself from deciding a judicial matter concerning a client of his former law firm. Prior to that he was with a Houston law firm, Baker, Botts, Shepherd & Coates, whose senior partner served as Pennzoil's general counsel.

Three, it was that same Houston law firm, Baker, Botts, Shepherd & Coates, that sent Mr. Gordon Gooch to be general counsel of the Federal Power Commission. Mr. Gooch brought Steven Wakefield, also of the same Houston law firm, to the Federal Power Commission as his chief assistant.

Mr. Gooch was general counsel at the Federal Power Commission from November 1969 to July 1972, when he became a full-time coordinator and fund raiser with the Committee to Re-Elect the President.

While Mr. Gooch is now in private practice, representing his Houston law firm's Washington interests, one of his most trusted ex-lieutenants, Mr. Frank Allen, is now Commissioner Moody's chief assistant.

In addition, Mr. Gooch's chief lieutenant, Steven Wakefield, is currently the Nixon administration's assistant secretary for energy and minerals in the Department of the Interior. In that capacity he supervises the operations and policies of the Nixon administration's Office of Oil and Gas, the Bureau of Mines, and U.S. Geological Survey.

In his high Government office Mr. Wakefield has constantly advanced the petroleum industry's cause, including opposing the imposition of mandatory controls over gasoline allocation and supporting gas price deregulation.

While at the Federal Power Commission, Gooch and Wakefield worked closely, not only with Commissioner Moody, but also with Commissioner Pinkney Walker, the first Nixon Federal Power Commission appointee to publicly advocate gas deregulation, and with Walker's chief assistant, Kenneth Lay.

Walker, who has since retired from the Commission, is the brother of Charls Walker, and that is spelled C-h-a-r-l-s, no "E," who was President Nixon's Under Secretary of the Treasury under John Connally. Secretary Connally has, of course, recently returned to the White House staff, at least temporarily, from his Texas law firm, one of the largest practices representing the oil industry.

And Charls Walker is now a registered lobbyist for the oil and gas industry, with the specific responsibility to pressure for price deregulation. Before becoming a petroleum industry lobbyist, Secretary Walker was most instrumental in getting his brother's chief lieutenant, Kenneth Lay, a new job as Deputy Under Secretary of the Interior.

Secretary Lay is now also the executive director of the new energy board. No doubt Mr. Walker as a lobbyist for the oil companies is now well pleased with Mr. Lay's efforts on behalf of deregulation.

These efforts culminated in April, when Interior Under Secretary Whitaker transmitted the administration's gas deregulation bill to Congress. That, of course, is not to say that Secretary Lay's views are merely the result of his association with Mr. Walker. Undoubtedly, his strong pleading for deregulation may in part be related to his past affiliation with the Humble Oil & Refining Co., now Exxon, his employer from 1965 to 1968.

I have a chart on page 6–A, which I will not read, which delineates some of the points that I have just made. Finally, while my investigation indicates that the Federal Power Commission's chairman, Mr. John Nassikas, is not among the inner circle of the petroleum industry's favorite insiders, it should not be forgotten that less than 2 months after taking office the New York Times quoted him as saying: "We had the Kennedy round of tariff negotiations. What we need is a Nassikas' round of gas rate increases." This was from the issue of September 21, 1969.

I would submit, Mr. Chairman, that statements like this must bear a great deal of the responsibility for our present energy shortage. What sensible, self-interested gas producer, having heard that the chairman of the Federal Power Commission intends to push for substantially escalated gas prices, or who knows that all of the members of the Federal Power Commission favor deregulation, would sell his gas today, rather than hold it off the market and get two or three times as much as soon as Chairman Nassikas and his colleagues are able to implement their plans?

If, as these gentlemen advocate, we deal with the gas shortage by inflating petroleum industry profits to record levels, are we not creating an incentive for permanent shortages? As I will explain in a moment, the Federal Power Commissioners have made good on their promises to the industry.

As long as they continue to promise higher prices, to ignore the anticompetitive market structure of the oil industry, and to sanction staff action that would destroy relevant documents, our energy problems will not improve. They will become even more burdensome.

Let me hasten to say that the solution to our gas shortage is not deregulation. What is needed is effective consumer-oriented regulation, regulation that requires oil companies to produce gas rather than sit on it; regulation that results in reasonable prices, proper allocation of reserves to the public and that avoids massive profit windfalls. That is the only obvious solution to the oil industry's monopolistic excesses.

At this point, I believe it would be helpful to review for the record recent Federal Power Commission actions which demonstrate that the Commission has abandoned its historic role as the consuming public's regulatory guardian.

Mr. Chairman, I am not going to read this into the record here, since you have put the entire statement in. In the most part it is a rehash of your own work, so it's a little bit redundant. I am going to skip over to page 11, at the top of the page.

State commissions have understandably taken a dim view of this latest price-juggling act. Most notably, the State of New York has requested blanket intervention and a formal hearing if flowing gas prices are escalated by the oil companies. As I understand it, the Federal Power Commission has refused the New York request. What is involved, substantively, in all of these repricing cases, is that the Nixon commission is anxious to permit higher prices even after the consumer has already paid for all of the investments associated with the exploration and development of producing wells.

This makes absolutely no sense and is totally unfair. Since all of the capital has been repaid, the renegotiated price should be lower, not higher. That, however, would not result in the kind of profits coveted by the petroleum industry.

This list of windfalls, impressive as it is, is not the full extent of the benefits bestowed on the oil industry by the Nixon commission. The Federal Power Commission, through another new gimmick known as "advance payments procedures," is now in the process of burdening consumers with over $200 million per year in additional overcharges.

This procedure, adopted in Commission No. 465, issued December 2, 1972, provides for interest-free loans to producers, funded by the pipeline customers. It is even possible for an interstate carrier like Tennessee Gas Pipeline to make such a loan to its own affiliate, the Tenneco Oil Co., or for United Gas Pipeline to make a loan to its parent, Pennzoil.

Finally, Mr. Chairman, permit me to share with you and this committee some of the knowledge I obtained several months ago when I personally intervened in the Commission's historic *Belco* case which set the stage for a minimum 73-percent gas price increase. I speak here from intimate, individual experience as I personally attended the Belco hearings and cross-examined industry witnesses.

I came away from that experience with several strong impressions. In marked contrast to the Commissioners themselves, the judge who heard the case and the Commission staff members who participated in developing the evidentiary record demonstrated commendable dedication to serving the public interest.

Unfortunately, but as one might have anticipated, the Commission precluded the judge from rendering an opinion. Even though none of the Commissioners was present at any of the hearings which I attended, and therefore had to work from a written transcript, they chose to render the initial opinion themselves, rather than follow the customary procedure of allowing the presiding administrative law judge to render an initial recommendation.

This action establishes a basis for believing that the Commissioners were afraid of what the administrative law judge would recommend. In addition to this astonishing action, they totally dismissed the critical evidence submitted by their own staff.

In what I consider to be an inept and biased opinion, they actually engaged in a collateral attack upon their own staff, berating them for having attempted to present a strong factually supported case concerned with consumer interests. Given this proindustry posture which Commissioner Moody and his followers have assumed, it is no wonder, Mr. Chairman, that some misguided, ambitious staff members made "judgment errors," and the week after President Nixon's energy message, attempted to destroy documents which have been requested by this committee and which could prove embarrassing to the Nixon administration.

The Commission staff's factual presentation in the *Belco* case established that the petroleum industry is not structurally competitive. We cannot rely upon the existing market structure in this industry to produce economic results that are in the public interest.

Because of the tight control exerted by the major integrated oil companies, and because of the closely knit partnership arrangements which you have so well referred to as a family-style arrangement which binds virtually all oil and gas producers to a common unity of purpose, the result of President Nixon's deregulation and free-market proposals will be massive price increases in all petroleum products, as well as the further demise of small independent businesses.

In order to illustrate for you the type of structural situation which I have described—and I go on to give some examples from the *Belco* case, Mr. Chairman, which again I will not take the time of the committee to read, they are based upon the submissions in *Belco* and are available there, also. I will skip over to page 16 for my summary.

In summary, let me say that I cite the *Texaco* case only as an example. These and other partnership arrangements pertain to virtually all of the major oil companies. In short, this industry is fully integrated in almost all respects.

I might say in addition to being fully integrated it is totally coordinated in a snarled web of mutually interlocking joint interests. Some may argue that there are certain legitimate economic reasons for some of these close economic interrelationships of oil and gas producers. I, for one, however, believe that a thorough and a vigorous Justice Department investigation of possible antitrust violations is long overdue.

The problem is that these substantial joint interests in production, exploration, and marketing, even if some of them are fully legitimate, create an atmosphere of close cooperation rather than competition. The structure of this industry is, in fact, that of a cartel.

We have here an economic system of companies acting together in their mutual self-interest. Since this is what exists, and since the Nixon administration and its Federal Power Commission appointees have failed to regulate or to break up this cartel, Congress is obligated to act.

Congress is the only branch of Government left that can insure that the gas and oil producers do not seize upon our present energy shortage as their vehicle for extracting the maximum possible tribute from the American people.

I must also comment that in many cases the effects of the cartel-like structure of the petroleum industry extend beyond the limits of that industry. Because most major oil and gas producers are not only involved in other aspects of the petroleum business, such as refineries, pipelines, retail distribution, and so forth, but in other industries as well. Their production profits are camouflaged in their aggregate corporation reports.

For example, Tenneco, Inc., one of the largest corporate enterprises in the United States, is, in addition to oil and gas production, engaged in the production of farm machinery, J. K. Case Co.; agriculture and food processing, Heggleblade-Marguleas Co.; agriculture and real estate development, Kern County Land Co.; chemical production, Tenneco Chemical Co.; banking, Houston National Co.; oceanographic research, Deep Sea Ventures, Inc.; and shipbuilding, Newport News Shipbuilding & Dry Dock Co.

In situations like this it is not only next to impossible to determine petroleum profits from public sources, it is also unknown whether these profits are used to subsidize other corporate business activities, thereby giving Tenneco subsidiaries an upper hand in businesses where they do face potential market competition. This is a particularly serious problem in agriculture, where the vertically integrated conglomerate can manipulate prices and profits to freeze out smaller producers, and be financed with millions of dollars in farm subsidies while it is doing it.

These subsidies are, of course, in addition to the subsidies which the petroleum producers already enjoy through the oil depletion allowance, oil import quotas, and other forms of corporate welfare paid for by the ordinary taxpayer.

In closing, I do have some policy recommendations for this committee and the Congress to consider.

Number one: Amend the Natural Gas Act to require the Federal Power Commission to set prices based solely upon costs plus a fair rate of return, and to require production at those rates, and outlaw the notorious optional pricing procedure.

Two: Roll back the recent massive price increases to the level prevailing as of January 1 of this year. If we wish to discourage consumption of our limited supply of natural gas, put a public excise tax on it. We don't need private tax collectors, and we should not give the producers a 30- to 60-percent profit windfall which really belongs to the people.

Three: Eliminate the intrastate exemption for gas producers, thereby permitting effective regulation of all the gas produced by this highly noncompetitive industry.

Four: Create a public corporation to explore and develop our offshore oil and gas reserves, which, after all, are our Nation's energy legacy and belong to all our people. Such a public corporation would act as a pricing yardstick for the private corporations to compete against; and

Five: Require that the energy corporations have consumer representatives on their boards of directors. Such an extreme step may be the only way to prevent collusive action between the energy corporations, among themselves, and with such regulatory agencies as the Federal Power Commission.

Mr. Chairman, I appreciate this opportunity to appear before you on this important matter, and I commend the committee again for its diligence in pursuing this subject.

Senator HART. Congressman, thank you very much for the detailed testimony that you have given. Your dedication and concern for the consumers of this country are well known. I perhaps should have expected—but truthfully I didn't—the kind of thought and work that went into the testimony that you offered.

Too often those of us in the Congress who appear at these hearings sort of drift by, leaving no mark. You most certainly have not, and we are grateful to you for it.

Representative BROWN. Your statements are very kind, Mr. Chairman.

Senator HART. In the *Belco* case, to the extent that you were able to observe it, what was the strength in terms of economists and lawyers and so forth, of the Commission, as contrasted with the staff strength of those economic interests that the Commission was supposed to be regulating?

How does that batting order look to you as a third-party observer?

Representative BROWN. This is obviously a subjective opinion. This was my first appearance before the Federal Power Commission, and I gathered the first time that any Congressman had appeared over there. I was, frankly, a little amazed to see the extremely large battery of very able attorneys, and I am sure very well paid attorneys, that appeared on behalf of the proponents of the rate increase.

There was always present a minimum of a dozen or more of what I quickly came to recognize were the best attorneys in the country, representing the aggrieved applicants. The staff of the Commission was generally represented by—I am not sure I am aware of all of the staff that was there, but at the staff table there were possibly two, three, or four members of the FPC staff. Then, in addition, of course, there were the representatives of the interested consumer groups or State agencies, such as the New York commission, which would seem to be represented there, seeking to protect the interest of the consumers of their own State or the agency that they represent.

But there is no question that the FPC staff was badly outgunned, if you just count the bodies.

Senator HART. We heard about that. But you are right. I don't think any of us has ever gone to one of those hearings, much less become a party in the proceedings. I am hopeful that in addition to criticizing what we believe to be mistakes on the part of these regulatory agencies, we will be willing to come up with the kind of budget money that will enable—in most cases I am sure there is very dedicated personnel—enable the personnel to have the strength adequate to meet the opposition.

Representative BROWN. I hope you won't try to match the petroleum industry. I think that would bankrupt the Federal Government.

Senator HART. I am suggesting two figures at the moment for the Federal Trade Commission. It is, I think, $2.2 million—$2.6 million—an increase in that amount. I am glad to report that the Appropriations Subcommittee did accept that figure and added it as an amendment to the bill.

I made the request of the Appropriations Committee to increase it by $2.5 million. The figure to be made available to the Department of Justice Antitrust Division, where the total sum annually is in the order of $12 to $15 million—$12.6 million is what we give the Department of Justice.

That could be expended quickly just in pretrial skirmishes if they did engage in a major controversy.

Representative BROWN. I recall, Mr. Chairman, all too vividly that we had indicated publicly that the FPC is unable, because of the staff, to handle its regulatory responsibilities in important cases.

I know that the Antitrust Division has faced considerable difficulties in having major cases, such as IBM, and frankly, to go into a thorough investigation of the petroleum business exceeds in magnitude the IBM problems by at least a factor of 10.

Senator HART. You say it would be 10 times the resource burden to do a thorough investigation of the petroleum industry?

Representative BROWN. Yes. sir. At least 10 times.

Senator HART. That does give us an idea of how grossly inadequate is the funding of the agencies that we look to to protect us from the evolution of giants. Now, when you became a party to the *Belco* proceedings,were you able to obtain from the companies specific cost information, specific reserve data?

Representative BROWN. No, sir. Every attempt to go beyond a certain prescribed line was met by the objections of the attorneys of the companies. In the bulk of these situations, of course, the decision was up to the administrative law judge as to whether to require the companies to answer or not.

In most of the situations he would accept the contention of the industry that the material, for one reason or another, was not pertinent and would not order the Government action. I might say this was not only my own experience, but that of other intervenors who sought to get behind the surface, to get detailed cost data.

The important thing unexamined in these proceedings, of course, is any relationship of the price sought for the gas to the cost of producing it. The cost data was never available.

Senator HART. As far as you know it is not in the record?

Representative BROWN. No, sir. It is not.

Senator HART. The interrelationships of some of the Power Commission personnel and the industry, that you detailed, convinces one more than ever of the value and the desirability of having on the Commission itself, in the one vacancy that now exists, a voice that has no such relationship—and preferably one that has an identification in the minds of the general public as a consumer advocate.

The connections that one brings with him to a regulatory agency need not, and I am willing to believe do not, affect one's judgment. But the public's opinion of us is full of suspicion, and when a regulatory agency has to enter an order which will please nobody, the order of a balanced agency is much more likely to be accepted, at least as an honest effort, by the displeased public.

When looking at the regulatory agency, they should see persons who are free of any of the relationships and associations with industry. That, really, when you get down to it, is the basis of my argument against Mr. Morris. That he was a gifted lawyer, there was no doubt. That he was an honorable man, nobody questioned. But if he was on the Commission and a tug of war arose, the people would look to it and say, "What would you expect from a man who had been with Standard of California for so many years."

That's the dilemma.

Representative BROWN. Mr. Chairman, it was doubly unfortunate, in his case, and I have the highest regard for the gentleman, that he suffered not only from his identification with the industry, but also from not favoring deregulation of gas, which is contrary to the industry position.

This, of course, was an unfortunate situation for an able gentleman. Nothing that I have said is intended to reflect on the parties involved. I am sure they are all able and honorable gentlemen. What has happened here probably was paralleled in previous administrations. Government figures were figures from law firms representing industry, and moved in and out of high administrative positions, commissions, Cabinet positions and so forth, moving into them to represent the public interest, and then back to their law firm where they resumed their private interest. You have a very real question of whether or not the system serves the public welfare, not whether these individual gentlemen are dishonorable.

Senator HART. I am glad that you made that point. Certainly, Commissioner Moody will have a chance to respond, and if any of the others that you have named want to add a statement to the record, we will permit that to be done.

One of the further complications in the public's reactions to Power Commission orders, and actions in omissions, is the traditional high level of political activity on the part of the oil industry. This activity principally is undertaken by the bookkeeping department.

And it does have its effect around here, I am sure. I couldn't identify it, but I do know that it tends to poison the public's opinion of the regulatory agency. Your description of the rush delivery, 2 days ahead of time, of cash—I take it it was cash, wasn't it?

Representative BROWN. I think that it was both cash and checks, but it was unrecorded.

Senator HART. In any event, to beat the recording deadline is the kind of thing that leaves all politicians looking lousy, and sometimes unfairly. But it reminds us, too, that Congress has responded to a point of enacting the new reporting and disclosure law, the 1971 Campaign Reform Act—that helps some.

I am one of those who believes that until we outlaw private money in political campaigns we will always have this distrust. Limiting the amounts that an individual can give and requiring them to be reported is good. But I heard one witness say that that's like treating an alcoholic by cutting down on the size of the shot glass and requiring him to record his intake. The poison still gets in his system.

Representative BROWN. I agree thoroughly with you, Mr. Chairman. I support the same view.

Senator HART. Mr. Chumbris?

Mr. CHUMBRIS. Thank you, Mr. Chairman. Congressman Brown, the time is short because the chairman has to go to an executive session of the Judiciary Committee, but there are a couple of points that I wanted to bring up.

Our Senators are necessarily in other subcommittees and some of them are preparing for the big bill on the floor. As you well know, there are many of your colleagues in the House and in the Senate, on both sides of the aisle, who disagree with some of the comments that you have made, and I will leave it to them to handle it in their particular forum.

But there is one point that you make in the last paragraph of your first page, regarding the substantial increases in the wellhead price of natural gas, and we question whether that argument is false, that there is a shortage due to the fact of the price of gas.

The Washington Post, in an editorial on June 21, 1973, referring to the price of gas, states as follows:

> We have shortages because of the present artificially low price of natural gas, and to relieve the shortages we are already beginning to import extremely expensive gas from overseas.
>
> The average price at the wellhead of our domestic natural gas is 20 cents per thousand cubic feet. Algerian gas, delivered to the east coast, costs about $1.25 per thousand cubic feet. Although the price has not yet been disclosed, the Soviet gas promised to the west coast will doubtless be in the same range.
>
> Natural gas competes with two other fuels, coal and oil, both of which are unregulated. The FPC has held the price of natural gas down to about half the price of the next cheapest industrial residual oil.

Mr. Swidler, a former chairman of the Federal Power Commission, who is going to testify later today, makes this comment on page 12 of his paper: "To the extent the price increases induce commensurate increases in gas findings, the price increases serve a valid economic function." Just one further point, and that is in the hearings held on November 13 and 14, 1969, on the natural gas supply study, chaired by Senator Frank Moss of Utah of that particular subcommittee, there was a colloquy Senator Moss had with Mr. McGuire, the president of a small oil company in Dallas, Tex.

They were pointing out that for over 10 years Mr. McGuire was trying to raise the price of his gas from 13½ cents to 16½ cents, but it was tied up in the Commission, et cetera. Then Senator Moss said, "Well, the consumers were saving 3 cents per thousand cubic feet during the 10 years."

But Mr. McGuire countered, "That isn't so, because while I wasn't getting that extra money, it was difficult for me to explore for new gas, and that applied to producers all over the country." So what happened was that they had to start using oil at 60 cents for a commensurate amount.

They had to use Algerian liquefied natural gas and synthetic gas, which runs from $1.25 to $1.50 per thousand cubic feet. And the consumers were paying for that; as an April Business Week article pointed out, the pipelines are already contracting for this liquefied natural gas at $1.50 per thousand cubic feet because they can't afford to leave those pipelines empty.

As that pipeline hits Detroit, Mich., and Milwaukee, Wis., two of the key States in the *Phillips* case back in 1951–54, they are going to have to pay for the liquefied natural gas.

So that is an issue which must be examined during the course of these hearings. Have we really impeded exploration as the Post seems to indicate that we have? I will let Mr. Swidler speak for himself in the rest of his paper.

Chairman of the Commission, Mr. Nassikas, is going to testify on that point, and I think it is a key issue that we have pretty much avoided. That is, yes, let's keep the price of natural gas down, but if in doing so you are making the consumer pay three or maybe four times as much for 50 percent of the gas he is getting from these other sources, then the consumer is paying through the nose.

And everybody admits that natural gas is one of the best sources of fuel supply because it's clean and we don't have any problem with ecology. We don't have a problem with transportation as we do with other sources such as coal, oil, liquefied natural gas and synthetic gas.

Also, we had testimony in another hearing before the Interior Committee last Thursday and Friday, where there was talk about getting gas and energy from the solar system, and from other new sources that they hope in the future will even replace some of the natural gas that we cannot get today.

So the issue is not just whether the consumer is going to pay if the price of natural gas goes up a little higher. The question is: If we don't get more natural gas, will the consumer pay two—three times two—$1.25 to $1.50—six times the current price of natural gas.

So that is something that we ought to look into. I know it sounds good in the paper to say we are helping the consumer by stopping this from going into effect, but if you look at it in the long run, the consumer is paying for some other things that the consumer advocate presses so strongly.

Representative BROWN. May I respond to that?

Mr. CHUMBRIS. Yes, sir.

Representative BROWN. First, I agree with Mr. Swidler to the extent that an increase in natural gas prices which would encourage exploration for additional gas supplies is justified. But record does not bear out the fact that increased prices have produced increased exploration.

In fact, there is ample evidence to indicate that just the opposite is true: that increased prices, over a given period of years, have not produced additional exploration or additional reserves. The fundamental fallacy in the argument is that it assumes that the industry operates under the conditions of the market—in other words, that it is, in fact, competitive, and motivated by the normal, competitive market incentives. This is not the case. The industry is semicartel like, semimonopolistic and you will have ample testimony on that, in addition to the few points I have produced.

Under those conditions you can't be sure an increased price will do anything except increase the windfall profits. In effect, they allow this industry to lay a tax on the American consumer, which if they were to use it as the Government would, to engage in additional exploration or even to do R. & D. in new sources of energy, I would be perfectly willing to support.

Because energy is underpriced in our society, it does need an increased price to discourage the wasteful use we now engage in. But that increased price should not go merely to windfall profits in the industry, which is what is happening at the present time.

Let me give you one example of a comparable situation. I come from Los Angeles. We have a chronic water shortage out there. We pump water from a local water table, and we get it at, say—and I am making these figures up—10 cents per thousand cubic feet, but there is only a third as much as we need. We have to import the rest from as much as 300 miles away. It costs a dollar, not 10 cents per thousand cubic feet, for that imported water. If the petroleum industry owned that water supply they would say to the consumers in Los Angeles, "It costs us a dollar per thousand cubic feet to import this water so we are going to charge you a dollar per thousand cubic feet for this water we pump from the local ground table, which only costs us 10 cents per thousand cubic feet, and you are going to pay because it's only reasonable.

"The alternative supply which you have to have costs a dollar. It's only reasonable that you should pay a dollar for that which costs us 10 cents to pump."

Mr. CHUMBRIS. Congressman, I don't want to get into a debate with you because I read your statement, and the points that you have just stated you have in your paper, with the exception of this water issue. But the two points that another witness makes will bear on this.

One is the leadtime you need from the time that you would get this increased price that you can therefore go out and discover, explore, develop and then pump. It is the leadtime you need. That leadtime has not been put into effect, because the price increases that have been given are very few so far.

All existing contracts are still under the old price. So that is one point. As for the second point, I went out and saw the chairman of the Oklahoma State Corporation Commission that has jurisdiction over oil.

We were trying to find out—this goes back about 2 years—how we could improve our supply of gas. We discussed the question of price. He pointed out that right now in eastern Oklahoma we have been getting gas from 3,000 to 6,000 feet.

He said, "We have plenty of gas in another part of the State, but they have to dig through rock at 22,000 to 30,000 feet." Now that's an increased cost, and if this price had been held down to 60, or even less than 60 as some people desired, while everything else in our economy has risen, such as the prices of meat, bread, milk and rent.

If that price is still back there at 13½ cents per thousand cubic feet, as this man stated, then he is not going to go to the western part of that State to dig 30,000 feet when 13½ cents isn't enough to meet his additional costs in the eastern part of the State.

So I say I shouldn't be debating this with you, but since you bring these points out, I think these questions should be borne in mind by the succeeding witnesses. I know we look like a bunch of ogres up here, sitting around trying to defend the oil industry, but as far as I am concerned, we haven't the slightest concern about the oil industry. We are concerned whether we are going to get good gas and good oil and all of the products that we need. We want no more brown outs in Florida, as Senator Guerney stated a few weeks ago, no more loss of power in New York or shutting down plants in Cleveland for 9 to 10 days, putting people out of work.

That is what we have to resolve. These Senators, good colleagues of yours, probably some from your State and some from neighboring States, look like they are supporting the oil industry when they are fighting for, probably, the biggest industry in their specific States.

For example, Senator Nelson and Senator Proxmire fight for the dairy industry in Wisconsin, and Senator Muskie fights very strongly for the shoe industry in Maine. You can't say, "He is interested in industry and not in the consumer," just because he is fighting for the shoe industry in Maine.

Representative Brown. If I may respond again, I will speak only about the point that you made on leadtime. I gather that it was in rebuttal to my statement that increased prices have not brought about increased investment in drilling. In my intervention in the *Belco* case I repeatedly asked the representatives of the industry if they would make any commitment whatsoever to an increase in their exploration for gas.

They refused to do so. They are not willing to make a commitment to increase the amount of exploration, and they would be crazy to do it. All they have to do is sit. The gas doesn't go away. People are pressuring for higher prices. Keep the supply short. The longer they sit the more the price goes up. Even the Russian and Algerian gas will go up to $2 and $3 before long.

By using this diminishing supply of gas which will still cost them 15 cents per thousand cubic feet to produce, they can argue for $3 per thousand cubic feet. And if I was a prudent businessman in their position, I would do exactly the same thing.

Mr. CHUMBRIS. Yes. But everybody—of the 400 or 500 independent producers in the United States, all are not Standard Oil companies, and they can't afford to sit there. They have to be able to get so much money to keep their operation going.

A Nebraska man who called the other day pointed out that because of the price freeze—and he is in an entirely different business—he has had to shut down. He laid off all of his employees, because with that freezing of price he can no longer maintain his business. This means that everybody can't just sit on their product and hope that in 2 or 3 years from now it is going to draw a better price than it does now.

There are a lot of people who have to have that income coming in all the time to be able to meet their financial obligations or they will have to shut down as this man did.

Representative BROWN. And there will be many others shutting down. The chairman himself indicated that four owners hold 95 percent of the reserves in southern Louisiana. The other umpteen owners you mentioned have the other 5 percent, and they will go broke—but not the four who own the 95 percent.

Mr. CHUMBRIS. According to testimony on the oil import quota, over 75 percent of the new discoveries of oil—and I am not so sure that applies to natural gas—are made by the independent producers, and not by the major companies.

And other testimony in the oil import quota hearings in 1969 and 1970 in this subcommittee and also in the House Interior Committee confirms this.

Senator HART. Congressman, thank you very much.

Representative BROWN. It has been a pleasure appearing before you, Senator.

Senator HART. As Mr. Chumbris indicated, the full Committee on the Judiciary has a call in executive meeting. I am held under the rules to suspend until that meeting is concluded. We will recess. I would hope to resume by noon.

[Whereupon, at 11:05 a.m., the subcommittee recessed, to reconvene at 12:40 p.m. this same day.]

[Congressman Brown's prepared statement follows. Testimony resumes on p. 36.]

PREPARED STATEMENT OF HON. GEORGE E. BROWN, JR., A U.S. REPRESENTATIVE FROM THE STATE OF CALIFORNIA

MR. CHAIRMAN AND MEMBERS OF THIS COMMITTEE: I testify before you today about my experience with the petroleum industry and the Federal Power Commission. As a member of the Energy Subcommittee of the Science and Astronautics Committee of the House of Representatives, I have become painfully aware that we face a grave energy crisis. What I am most concerned about in this regard is the vacuum of leadership and responsibility which has led to an unprecedented energy shortage in this country. In my judgment this shortage has occurred because leaders in government and industry have acted to maximize their own short term interests at the expense of the consuming public. Industry has attempted to maximize its profit, certain public officials have been more interested in serving private interests rather than public needs, and our institutions and agencies have laid prostrate, accomplishing little or nothing in our greatest hour of need.

One of the major questions that I want to explore in this testimony is why the Federal Government and, in particular the Federal Power Commission, has failed to act decisively and effectively as our energy crisis has mounted.

For example, the petroleum industry has over the last several years repeatedly asked for and received substantial increases in the well head price of natural gas. These price increases have been approved by the Federal Power Commission on the ground that if the price of natural gas is allowed to increase more exploration for natural gas will occur and the shortage of natural gas will be alleviated. This argument has proven to be false. The Federal Power Commission has gone along with the petroleum industry, permitting the price of natural gas to nearly triple in the last 3 years and yet, if one believes the figures offered by the petroleum industry, the shortage of natural gas has only worsened.

We have been repeatedly warned by both scholars and practical politicians that independent regulatory agencies are in constant danger of being taken over and controlled by the very industries that they are charged with regulating. I submit to you that recent events and the facts uncovered by both my staff and diligent investigative reporters indicate that this has happened to the Federal Power Commission. This demise of the Federal Power Commission as an independent and vigorous regulator and planner has permitted the energy shortage to deepen in severity with untold cost to the American consumer.

Recent startling developments have focused attention on the Federal Power Commission and its actions. For example, earlier this month both the *Washington Post* and the *Los Angeles Times* reported that certain important documents had been ordered destroyed by officials at the Federal Power Commission *after* this Committee had requested them. These documents, I am informed, indicate that the shortage of natural gas reserves may not be as severe as the Federal Power Commission and the oil companies claim and that, incredibly, as much as 80 percent or more of our available uncommitted gas reserves may be controlled by four or five oil companies, a situation which would indicate the existence of classic monopoly power.

What has happened that could lead to such extreme conduct by public officials that they would order critical documents destroyed to keep them out of the hands of a Congressional committee? I have been brought to the deeply disturbing conclusion that it is a "Watergate" mentality and that this mentality strikes into the very heart of the regulatory and administrative bodies that deal with the energy crisis.

In an article in the *Washington Post*, May 13, 1973, entitled "Watergate Reveals Gamey Election Money," Morton Mintz, a widely respected financial reporter, described in detail the penetration of the Federal Power Commission by the oil industry, through what is now a classic political weapon: Massive campaign contributions that are difficult, if not impossible, to trace. This article pointed out how William Liedtke, President of Pennzoil United (owner of United Gas Pipeline and gas producing affiliates all regulated by the Federal Power Commission) raised $700,000 for the Committee to Re-elect the President from his friends in the petroleum industry and had the money flown to Washington two days before the Federal disclosure law took effect, thus keeping the contribution secret.

Subsequent to these and other contributions from oil interests, President Nixon appointed two nominees to the Federal Power Commission who favored deregulation of natural gas. Such deregulation would result in massive windfall profits to the oil industry and substantial price increases for the American consumer. These nominees, one of whom has now been rejected by the Senate, would have joined three other sitting Commissioners who also advocate deregulation. Hence, we have a regulatory Commission made up of commissioners so industry oriented that they publicly advocate that the Commission should give up its function. Instead of enforcing statutes enacted by the Congress, and providing consumer protection against monopoly exploitation, they have chosen to use their high office to undermine public surveillance of the industry, and to serve private oil and gas interests.

Following the Morton Mintz article of May 13, 1973, focusing on the role of William Liedtke (President of Pennzoil United) my staff and I have conducted a private investigation of major oil industry connections in the Federal Government. Among our significant findings are the following:

1. The same William Liedtke of Pennzoil, who funnelled $700,000 to the Nixon Re-election Committee, is reported to have interviewed and offered the Federal Power Commission post to present Commissioner Rush Moody, Jr., prior to his appointment by President Nixon. Commissioner Moody has now authored the astonishing Federal Power Commission opinion in the widely-reported Belco case, which sets the stage for gas price increases of at least 73 percent at the wellhead and in effect deregulates the price of natural gas by administrative fiat through a procedure termed "optional pricing."

2. Commissioner Moody, before his Liedtke-Nixon appointment to the Federal Power Commission, was associated with a Midland, Texas law firm, Stubbeman, McRae, Sealy, Laughlin and Browder, which represents the interests of some of the largest petroleum companies, including but not limited to Texaco, Inc. (a party to the Belco case) and Mobil Oil Company. It is astonishing that Commissioner Moody did not disqualify himself from deciding a judicial matter concerning a client of his former law firm. Prior to that, he was with a Houston law firm, Baker, Botts, Shepherd and Coates, whose senior partner served as Pennzoil's General Counsel.

3. It was that same Houston law firm, Baker, Botts, Shepherd and Coates, that sent Mr. Gordon Gooch to be General Counsel of the Federal Power Commission. Mr. Gooch brought Steven Wakefield, also of the same Houston law firm, to the Federal Power Commission as his chief assistant.

Mr. Gooch was General Counsel at the Federal Power Commission from November, 1969 until July, 1972, when he became a full-time coordinator and "fund raiser" with the Committee to Re-elect the President.

4. While Mr. Gooch is now in private practice, representing his Houston law firm's Washington interests, one of his most trusted ex-lieutenants, Mr. Frank Allen, is now Commissioner Moody's chief assistant. In addition, Mr. Gooch's chief lieutenant, Steven Wakefield, is currently the Nixon Administration's Assistant Secretary for Energy and Minerals in the Department of Interior. In that capacity he supervises the operations and policies of the Nixon Administration's Office of Oil and Gas, Bureau of Mines and U.S. Geological Survey. In his high government office, Mr. Wakefield has constantly advanced the petroleum industry's cause including opposing the imposition of mandatory controls over gasoline allocation and supporting gas price deregulation. While at the Federal Power Commission, Gooch and Wakefield worked closely, not only with Commissioner Moody, but also with Commissioner Pinkney Walker, the first Nixon Federal Power Commission appointee to publicly advocate gas deregulation, and with Walker's chief assistant, Kenneth Lay. Walker, who has since retired from the Commission, is the brother of Charles Walker, who was President Nixon's Under-Secretary of the Treasury under John Connally. Secretary Connally has, of course, recently returned to the White House staff from his Texas law firm (one of the largest practices representing the oil industry), and Charles Walker is now a registered lobbyist for the oil and gas industry with the specific responsibility to pressure for price deregulation. Before becoming a petroleum industry lobbyist, Secretary Walker was most instrumental in getting his brother's chief lieutenant, Kenneth Lay, a new job as Deputy Undersecretary of Interior. Secretary Lay is now also the Executive Director of the New Energy Board. No doubt Mr. Walker as a lobbyist for the oil companies is now well pleased with Mr. Lay's efforts in behalf of deregulation. These efforts culminated in April, when Interior Undersecretary Whitaker transmitted the Administration's Gas Deregulation Bill to Congress. That, of course, is not to say that Secretary Lay's views are merely the result of his association with Mr. Walker. Undoubtedly his strong pleading for deregulation may in part be related to his past affiliation with the Humble Oil and Refining Company (now EXXON), his employer from 1965 to 1968.

NIXON GAS DEREGULATION TEAM

1. John Connally, Presidential Assistant, formerly Secretary of the Treasury. His Texas law firm represents many oil company interests.

2. Rush Moody, Jr., Federal Power Commissioner, formerly a Texas oil industry lawyer; an ex-Gooch lieutenant (Mr. Frank Allen) is now his chief assistant.

3. R. Gordon Gooch, former Federal Power Commission General Counsel, now with the Washington office of a major Houston law firm. A long history of representing Texas oil interests.

4. Charles Walker, a native Texan, formerly Undersecretary of the Treasury, now a principal oil industry lobbyist. His brother was the Federal Power Commissioner to advocate deregulation.

5. Stephen Wakefield, now Assistant Secretary of Interior, formerly assistant to Federal Power Commission General Counsel Gooch, and an associate in Gooch's Texas law firm.

6. Kenneth Lay, now Deputy Undersecretary of Interior, formerly assistant to Federal Power Commissioner Walker, and an economist with the Exxon Corporation in Texas.

Finally, while my investigation indicates that the Federal Power Commission's Chairman, Mr. John Nassikas, is not among the inner circle of the petroleum industry's favorite insiders, it should not be forgotten that less than two months after taking office the *New York Times* quoted him as saying, "We had the Kennedy round of tariff negotiations. What we need is a Nassikas' round of gas rate increases." (9/21/69)

I would submit, Mr. Chairman, that statements like this must bear a great deal of the responsibility for our present energy shortage. What sensible, self-interested gas producer, having heard that the Chairman of the Federal Power Commission intends to push for substantially escalated gas prices, or who knows that all of the members of the Federal Power Commission favor deregulation, would sell his gas today, rather than holding it off the market and getting two or three times as much as soon as Chairman Nassikas and his colleagues are able to implement their plans? If, as these gentlemen adocate, we deal with the gas shortage by inflating petroleum industry profits to record levels, are we not creating an incentive for permanent shortages?

As I will explain in a moment, the Federal Power Commissioners have made good on their promises to the industry. As long as they continue to promise higher prices, to ignore the anti-competitive market structure of the oil industry and to sanction staff action that would destroy relevant documents, our energy problems will not improve. They will become even more burdensome.

Let me hasten to say that the solution to our gas shortage is not deregulation. What is needed is effective consumer-oriented regulation; regulation that requires oil companies to produce gas rather than sitting on it; regulation that results in reasonable prices, proper allocation of reserves to the public and that avoids massive profit windfalls. That is the only obvious solution to the oil industry's monopolistic excesses.

At this point, I believe it would be helpful to review for the record recent Federal Power Commission actions which demonstrate that the Commission has abandoned its historic role as the consuming public's regulatory guardian. It is a record that you, Mr. Chairman, will recall only too well. It appeared in your submission to the Commission on April 27, 1972, in opposition to the adoption of the optional pricing procedure by the Federal Power Commission.

You showed in that submission that the Nixon Commission has arbitrarily decided that the oil companies do not have to make refunds of millions of dollars that are due consumers for overcharges that occurred prior to the establishment of area rate ceilings. You showed that the Commission has cavalierly terminated a moratorium on further rate increases which the industry itself agreed to less than two years ago when they obtained a major 35 percent area rate increase. You pointed out that this same Commission changed the rules recently by abandoning cost of service regulation for pipeline-produced gas, and you showed how the Commission engaged in sleight of hand by redefining underlying acreage, so that the petroleum industry could obtain higher prices on gas which otherwise would have been considered "old gas."

In addition, a number of other notable, though hardly commendable Commission actions have taken place recently. Since your submission to the Federal Power Commission on April 27, 1972, the D. C. Circuit Court reversed the Commission's exemption of small producers from regulatory controls. The Commission had maintained that this "exemption" is not really deregulation since they intended to hold these producers to price levels no higher than the highest contract prices awarded the large producers, or the prevailing intra-state market price. Such a criteria is absurd. Since intra-state prices are not regulated, using such a price as a yardstick is nothing short of deregulation. Moreover, we know very little about who these intrastate dealers are and, therefore, we have no way of assessing their motivations. As the D.C. Circuit Court said in reversing this outrageous decision: "Indirect deregulation by such novel standards is worse than an outright exemption. Such an approach retains the false illusion that a government agency is keeping watch over rates pursuant to the statute's mandate, when it is in fact doing no such thing."

This illustration of *de facto* deregulation is not unique. Since the Moody-Walker faction at the Federal Power Commission seized policy control over gas matters (over token or at least weak opposition from the other members of the Commission who have since joined them), there has been a virtual avalanche of such "novel," if deceptive, regulatory arrangements. Since April 15, 1971, when the Commission ordered their now famous Order No. 431 for short term purchases, contract prices have escalated regularly. Prices as high as 45 cents per mcf are now approved routinely, and until this month there had never been a formal evidentiary hearing on these limited term rate increases. Now, after more than two years of approving these steadily escalating contract prices without once setting a hearing, the Commission finally on June 4th of this year scheduled its first hearing on an application which would establish a new threshold rate of 60 cents per mcf.

Apparently they feel that there may be some political risks in approving this price (which is 133 percent above the Southern Louisiana rate, established in July, 1971, and more than 70 percent above the unprecedented rate increase recommended by the Commission's own staff in March of this year), without going through the motions of a hearing.

What makes the hearing a farce is the fact that they refused to provide more than one week for their own staff to prepare and present a case. As a result, the staff was effectively precluded from representing the public interest. It is a shocking fact that the full record of this formal proceeding (Cotton Petroleum Corporation, Docket No. C173–536) consists *solely* of oil industry testimony.

In addition to these efforts to inflate the price of new gas sales to unprecedented levels, which means billions of dollars to the oil and gas producers, the Nixon Commission has also embarked upon a course of repricing flowing gas. That, as everyone in the oil industry knows, is where the really big money lies, and the beauty of the scheme is that the oil companies don't have to lift a finger or provide one more drop of energy. It's just a matter of raking off (or ripping off) higher profits on gas volumes which have already been committed to consumers at lower prices. It makes absolutely no sense from the standpoint of solving the energy shortage in this country.

The first step taken was in the Mitchell case (Opinion No. 649, issued February 21, 1973) where the Commission approved an increase in flowing gas rates from 18.86 cents per mcf to 30.25 cents. This resulted in an increase of three-and-one-half million dollars annually on this one sale alone.

In all due fairness to Chairman Nassikas, it should be noted that he filed a dissent in this matter. However, it was of no avail against the Moody-led majority, recently strengthened by the newly confirmed FPC Commissioner William Springer.

Another significant action taken by the Commission to escalate flowing gas prices came to light in a unanimous Commission opinion issued on December 12, 1972. In that case (Opinion No. 639) the Commission launched an attack on the concept known as "vintaging." Under vintaging, the Commission has consistently required that old flowing gas be sold at the originally approved contract prices. Now, however, the Nixon Commission will allow even already developed and flowing gas to be recontracted at current market prices, which will add billions of dollars to the consumer's energy bill.

State commissions have understandably taken a dim view of this latest price-juggling act. Most notably, the State of New York has requested blanket intervention and a formal hearing if flowing gas prices are escalated by the oil companies. As I understand it, the Federal Power Commission has refused the New York request.

What is involved, substantively, in all of these repricing cases, is that the Nixon Commission is anxious to permit higher prices even after the consumer has already paid for all of the investments associated with the exploration and development of producing wells. This makes absolutely no sense and is totally unfair. Since all the capital has been repaid, the renegotiated price should be lower, not higher. That, however, would not result in the kind of profits coveted by the petroleum industry.

This list of windfalls, impressive as it is, is not the full extent of the benefits bestowed on the oil industry by the Nixon Commission. The Federal Power Commission, through another new gimmick known as "advance payments procedures," is now in the process of burdening consumers with over $200,000,000 per year in additional overcharges. This procedure (adopted in Commission No. 465, issued 12/2/72) provides for interest-free loans to producers, funded by the pipeline customers. It is even possible for an interstate carrier like Tennessee Gas Pipeline to make such a loan to its own affiliate the Tenneco Oil Company or for United Gas Pipeline to make a loan to its parent Pennzoil.

Finally, Mr. Chairman, permit me to share with you and this Committee some of the knowledge I obtained several months ago when I personally intervened in the Commission's historic Belco case which set the stage for a minimum 73 percent gas price increase. I speak here from intimate individual experience as I personally attended the Belco hearings and cross-examined industry witnesses. I came away from that experience with several strong impressions. In marked contrast to the Commissioners themselves, the judge who heard the case and the Commission staff members who participated in developing the evidentiary record demonstrated commendable dedication to serving the public interest. Unfortunately, but as one might have anticipated, the Commission precluded the Judge from rendering an opinion. Even though none of the Commissioners was present at any of the hearings which I attended, and therefore had to work from a written transcript, they chose to render the initial opinion themselves rather than following the customary procedure of allowing the presiding administrative law judge to render an initial recommendation. This action establishes a basis for believing that the Commissioners were afraid of what the administrative law judge would recommend.

In addition to this astonishing action, they totally dismissed the critical evidence submitted by their own staff. In what I consider to be an inept and biased opinion, they actually engaged in a collateral attack upon their own staff, berating them for having attempted to present a strong, factually-supported case concerned with consumer interests.

Given this pro-industry posture which Commissioner Moody and his followers have assumed, it is no wonder, Mr. Chairman, that some misguided, ambitious staff members made "judgment errors" and the week after President Nixon's energy message attempted to destroy documents which have been requested by this Committee and which could prove embarrassing to the Nixon Administration.

The Commission staff's factual presentation in the *Belco* case established that the petroleum industry is not structurally competitive. We cannot rely upon the existing market structure in this industry to produce economic results that are in the public interest. Because of the tight control exerted by the major integrated oil companies and because of the closely knit partnership arrangements which bind virtually all oil and gas producers to a common unity of purpose, the result of President Nixon's deregulation and free market proposals will be massive price increases in all petroleum products as well as as the further demise of small independent businesses. In order to illustrate for you the type of structural situation which I have described, let me take a single example from the record produced in the *Belco* case. The example which I have selected pertains to Texaco, Inc., one of the parties to that case. One of the most interesting facts to emerge was the "bidding partnership" that exists between Texaco, Inc. and Tenneco Oil Company (Tennessee Pipeline, a Tenneco affiliate, was the so-called "competitive" buyer of the gas.) The staff's evidence showed that during the period 1970–1972, Texaco bid jointly *only* with Tenneco and that it did so twice as often as it bid independently. This long-term exclusive bidding partnership constitutes a substantial economic incentive for these two producers to "cooperate" with each other in all sorts of production and marketing activities and constitutes a substantial disincentive for them to compete against each other. This joint bidding partnership is only the first of many important partnerships and interties which Texaco has with other oil and gas producers.

For example, it was shown that Texaco or its subsidaries own leases in the State of Louisiana jointly with the following: Exxon, Amoco, Shell, Mobil, Atlantic, Chevron, Getty and Union. Texaco also jointly owns leases in the State of Louisiana with a number of smaller firms, including the following. C&K Petroleum, Consolidated Gas, Ocean Drilling, Placid Oil, Signal Oil, Newmont Oil and Louisiana Land and Exploration Company.

Another intertie is the joint ownership of offshore producing leases. The record in the Belco case demonstrated that Texaco holds an ownership interest in 55 Federal offshore producing leases. In 29 of the 55 leases, Texaco holds a joint interest with Amoco.

It is important to know that Texaco also has substantial partership arrangements with oil and gas producers in foreign joint ventures. For example, these foreign joint ventures include: Arabian American Oil Company, jointly owned by Texaco, Exxon, Chevron and Mobil (1971 production was 1.5 billion barrels of oil); Caltex, jointly owned by Texaco and Chevron (1971 operational income was $2.3 billion); Iranian Oil Participants, Inc., jointly owned by Texaco, Mobil, Exxon, Chevron, Gulf, British Petroleum, Shell, Atlantic, Signal and Getty (1971 production was 1.3 billion barrels of crude oil).

It is interesting to note that in all these ventures, Texaco's favorite major partners where consistently Exxon, Chevron and Shell. It was also shown that Texaco has a substantial interest in major interstate pipelines with other oil and gas producers. Texaco owns a 22 percent interest in Badger Pipeline along with Atlantic-Richfield, Cities Service and Union Oil. Texaco has a 5 percent ownership of Dixie Pipeline; other owners include, Amoco, Alantic, Cities Service, continental, Exxon, Mobil, Phillips, Shell, Gulf, Transco and Allied chemical. Texaco has a 34 percent ownership in Laurel Pipeline along with Gulf and Sohio. Texaco has a 14 percent ownership in Colonial Pipeline; its partners there are Atlantic, Amoco, Cities Service, Continental, Phillips, Gulf, Sohio, Mobil, and Union. Texaco has a 27 percent interest in Olympic Pipeline; other owners are Shell and Mobil. Texaco has a 17 percent ownership of Wolverine Pipeline along with Union, Mobil, Clark, Marathon, Cities and Shell. Texaco has a 9 percent interest in West Shore Pipeline along with Shell, Amoco, Marathon, Clark, Continental, Union and Exxon. Texaco owns a 40 percent interest in Wyco Pipeline, which is also owned by Amoco and Mobil. Texaco owns a 45 percent interest in the Texas-New Mexico Pipeline, also owned by Atlantic, Cities Service and Getty. In addition, Texaco owns foreign pipelines with Continental, Gulf, Marathon, Mobil, Chevron, Exxon, Sohio and Shell.

Finally, the *Belco* record indicated that Texaco has joined forces with other major firms in "producing units" in the Permian Basin. For example, Texaco joined with Atlantic-Richfield Company in 42 producing units, with Cities Service in 23 producing units, with Continental in 19 producing units, with Getty in 25 producing units, with Gulf in 23 producing units, with Mobil in 19 producing units, with Shell in 18 producing units, with Phillips in 22 producing units, with Amoco in 30 producing units, with Exxon in 22 producing units, with Sohio in 10 producing units, with Sun in 23 producing units and with Union in 11 producing units. In summary, it was shown that Texaco has the following relationships with Chevron: joint pipeline ownership, joint foreign exploration and development, joint ownership of Louisiana leases and joint refinery and processing plant operations; with Shell: joint producing in the Permian Basin, joint foreign exploration and development, joint pipeline ownership, joint refinery and processing plant ownership, joint ownership of Louisiana leases and crude oil exchanges; with Amoco: joint production in the Permian Basin, joint foreign exploration and development, joint pipeline ownership, joint refinery and processing plant ownership, joint ownership of Federal leases, joint ownership of Louisiana leases and joint crude oil exchanges.

In summary, let me say that I cite the Texaco case only as an example. These and other partnership arrangements pertain to virtually all of the major oil companies. In short, this industry in fully integrated in almost all respects.

Some may argue that there are certain legitimate economic reasons for some of those close economic inter-relationships of oil and gas producers. I, for one, however, believe that a thorough and a vigorous Justice Department investigation of possible anti-trust violations is long overdue. The problem is that these substantial joint interests in production, exploration and marketing, even if some of them are fully legitimate, create an atmosphere of close cooperation rather than competition. The structure of this industry is, in fact, that of a cartel. We have here an economic system of companies acting together in their mutual self interest. Since this is what exists, and since the Nixon Administration and its Federal Power Commission appointees have failed to regulate or to break up this cartel, Congress is obligated to act. Congress is the only branch of government left that can insure that the gas and oil producers do not seize upon our present energy shortages as their vehicle for extracting the maximum possible tribute from the American people.

I must also comment that in many cases the effects of the cartel-like structure of the petroleum industry extend beyond the limits of that industry. Because most major oil and gas producers are not only involved in other aspects of the petroleum business, such as refineries, pipelines, retail distribution, etc., but in other industries as well, their production profits are camouflaged in their aggregate corporation reports. For example, Tenneco, Inc., one of the largest corporate enterprise in the United States is, in addition to oil and gas production, engaged in the production of farm machinery (J. I. Case Co.), agriculture and food processing (Heggleblade-Marguleas Co.), agriculture and real estate development (Kern County Land Co.), chemical production (Tenneco Chemical Co.), banking (Houston National Co.), oceanographic research (Deep Sea Ventures, Inc.), and shipbuilding (Newport News Shipbuilding and Dry Dock Co.).

In situations like this, it is not only next to impossible to determine petroleum profits from public sources, it is also unknown whether these profits are used to subsidize other corporate business activities, thereby giving Tenneco subsidiaries an upper hand in businesses where they do face potential market competition. This is a particularly serious problem in agriculture, where the vertically integrated conglomerate can manipulate prices and profits to freeze out smaller producers, and be financed with millions of dollars in farm subsidies while it is doing it. These subsidies are, of course, in addition to the subsidies which the petroleum producers already enjoy through the oil depletion allowance, oil import quotas (now coming to an end) and other forms of corporate welfare paid for by the ordinary taxpayer.

In closing I do have some policy recommendations for this Committee and the Congress to consider:

1. Amend the Natural Gas Act to require the Federal Power Commission to set prices based solely upon the costs plus a fair rate of return, and to require production at those rates, and outlaw the notorious optional pricing procedure;
2. Roll back the recent massive price increases to the level prevailing as of January 1 of this year. If we wish to discourage consumption of our limited supply of natural gas, put a public excise tax on it. We don't need private tax collectors, and we should not give the producers a 30 to 60 percent profit windfall which really belongs to the people;
3. Eliminate the intra-state exemption for gas producers, thereby permitting effective regulation of all the gas produced by this highly non-competitive industry;
4. Create a public corporation to explore and develop our offshore oil and gas reserves, which, after all, are our Nation's energy legacy and belongs to all our people. Such a public corporation would act as a pricing yardstick for the private corporations to compete against; and
5. Require that the energy corporations have consumer representatives on their boards of directors. Such an extreme step may be the only way to prevent collusive action between the energy corporations, among themselves, and with such regulatory agencies as the Federal Power Commission.

Mr. Chairman, I appreciate this opportunity to appear before you on this important matter, and I commend the Committee for its diligence in pursuing this subject.

AFTERNOON SESSION

Senator HART. The committee will be in order. May I apologize particularly to the chairman and the Commission members, for a delay that was unavoidable, but I know enormously inconvenient. The executive committee meeting required us to suspend, and we expected two votes to occur back-to-back but only one materialized.

Let me begin by addressing myself to the problem of the subpenas. a problem which I know caused the Commission great concern. This is reflected in the order which the Commission has published and which I think, for the record, we should order printed.

Senator HART. My responses are more in the nature of a formal committee position than of personal reactions.

The committee, on June 21, by a vote of 6 to 0, issued a subpena duces tecum addressed to the chairman of the Federal Power Commission. It is my understanding that it was served at about 6:40 p.m. on the day the committee took its action, and the subpena is returnable.

I shall not list in full the documents that the subpena called for, but my statement will show, as will the Commission's order, that the subject matter is essentially threefold: The responses from the 79 reporting companies, worksheets, deposits, and the like, from the date received; all other writings referring to or relating to the rulemaking procedure; and those relating to the use and disposition of the data.

The legislative purpose of the subpena, we believe, is clear.

Before this subcommittee is Senate bill 1167, the Industrial Reorganization Act, a bill that would deconcentrate and restructure the petroleum and six other industries. Since 1970 the subcommittee has been investigating the validity of national gas reserves as reported, as well as the nature and extent of competition and concentration within the natural gas industry.

These investigations seek to determine what, if any, additional antitrust legislation is needed.

Finally, the subcommittee is now investigating the treatment and handling of the data that is requested. Originally, the subcommittee requested from the chairman of the Power Commission a substantial amount of this material. Our letters were dated May 7 and May 15, and oral requests were made by the subcommittee staff.

We were advised that under the Freedom of Information Act and the Natural Gas Act this information could not or should not be made available to us.

The Commission was on notice since March 7 that the subcommittee required—sought—the data, and hence, the June 22 order suggesting inadequate notice, as well as deprivation of rights, taking property without compensation and so on, appeared to me as not appropriate.

The references, in order 69 of the Commission and the correspondence, to widespread public dissemination by the subcommittee of the data we sought are confusing, because the subcommittee has not made a determination as to whether the material should be released—made public—at all.

Now the subcommittee had no doubt of its authority to subpena relevant and material information from an independent agency. On this occasion we described it as an arm of the Congress, or at least something that the Congress itself had created. We did not doubt the soundness of our requests. That the information which we sought, or a portion of it, was directed to be destroyed after our request was made compounds the matter.

From our point of view, we made every effort to accommodate the Commission as we, together, sought to obtain this information. We refrained from use of subpena power until we were convinced there was a clear likelihood that important information was being withheld and was indeed in jeopardy of being destroyed—at least some of it.

The Commission's final answer declining to supply the requested information did not come until June 18.

With respect to the law, as it relates to the subcommittee's propriety in seeking and obtaining the information, the Commsson's order cites the Freedom of Information Act and the Natural Gas Act as the basis for its belief that the material ought not be delivered. But the Freedom of Information Act, in section 552(B)7, explicitly states that this section is not authority to withhold information from Congress. There is in both the Senate and the House report accompanying that legislation further clarifying language.

In the Senate report dealing with the Freedom of Information Act, we find the following: "It is made clear that because this section only refers to the public's right to know, it cannot therefore be backhandedly constructed as authorizing the withholding of information from the Congress, the collective representative of the people."

Similarly, the House report states that the act is a law controlling public access to Government information and has absolutely no effect on congressional access to information. Members of Congress have all the rights of access guaranteed to any person, and the Congress has additional rights of access to all Government information which it deems necessary to carry out its functions.

As to the Natural Gas Act, there is a basis for withholding the information. Section 8B provides that "No member, officer or employee of the Commission shall divulge any facts or information which may come to his knowledge during the course of examination of books, records, data or accounts, except insofar as may be directed by the Commission or a court."

Rather than section 8B precluding the dissemination of information by the Commission, I think we have a situation where the Commission is specifically empowered to authorize disclosure of confidential information, hence the subcommittee's action, the issuance of the subpena, that is unconditional and the receipt of the documents, unconditional.

After reviewing the material, the subcommittee will determine whether the public interest requires the release of any or all of the documents and in what form, giving due consideration to what may be very valid claims of the companies and the Commission that the specific detail data should not be released intact to the public at large.

This, I suggest, is the form of the committee's reaction and response to the order and correspondence of the Commission, and all of it will be made a part of the record at this point.

[The documents referred to may be found in the appendixes (see contents, pts 1 and 2). The following correspondence was received for the record. Testimony resumes on p. 41.]

U.S. SENATE, SUBCOMMITTEE ON ANTITRUST AND MONOPOLY,
June 11, 1973.

Hon. JOHN N. NASSIKAS,
Chairman,
Federal Power Commission.
Washington, D.C.

DEAR MR. CHAIRMAN: The Sunday edition of the Washington Post reported the attempted destruction apparently by high ranking Commission personnel of company-by-company data provided by 79 large natural gas producers respecting total uncommitted natural gas reserves available for sale in mid-1972.

You will recall that on March 7, 1973, you were requested to provide a substantial amount of such data to the Subcommittee in connection with its investigation of the nature and extent of competition and concentration of control of natural gas reserves within the natural gas producing industry. That letter also requested you to make such material available to the Federal Trade Commission in connection with its investigation of the accuracy and reliability of aggregated natural gas reserves as reported by the American Gas Association.

Mr. Thomas Joyce of your staff responded, declining to provide the requested information and citing for support the Freedom of Information Act and the confidentiality section of the Natural Gas Act. You were then requested by the Subcommittee to appear with such material at hearings scheduled for June 6 and 7, later postponed to June 26.

If the newspaper report is correct, the attempted destruction of such material alone raises serious questions respecting propriety, motivation, as well as efficacy of FPC regulation. The on-again-off-again nature of the attempted destruction which apparently prevented use of such data by the Commission's Office of Economics in testimony opposing a 73 percent increase in natural gas prices at the wellhead (which the Commission approved last week), raises even more serious questions. The report of the attempted incineration in light of two requests outstanding by this Subcommittee for the material dictates the need for a full exploration and explanation of all events relating to the use and disposition of this data and a full public accounting by all responsible.

Therefore, I have instructed the staff of the Subcommittee to commence an immediate investigation, to interview privately all FPC personnel and members, and to examine all documents and files necessary or appropriate to ascertain all facts bearing on this question.

Your cooperation and your full assistance to the staff will be greatly appreciated.

Sincerely,

PHILIP A. HART, *Chairman.*

FEDERAL POWER COMMISSION,
Washington, D.C., June 18, 1973.

Hon. PHILIP A. HART,
Chairman, Subcommittee on Antitrust and Monopoly, Committee on the Judiciary, U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: This will respond to your letter of May 18, 1973, as supplemented by your May 22, 1973 letter, concerning hearings before the Senate Antitrust and Monopoly Subcommittee on June 26 and 27, 1973.

The Federal Power Commission members will be present, as you requested, at 10:00 a.m. on June 26, 1973.

As part of your May 18, 1973 letter, you requested that the Commission furnish your Subcommittee at the June 26 hearing "with detailed information producers gave the Commission which showed the concentration of certain reserves and the amounts controlled by the major producers." To comply with the request of your Subcommittee and to serve its legislative purposes, the staff has prepared and the Commission has determined this day to release to your Subcommittee, partially composited, uncommitted reserve data to identify the concentration ratios for the top four, eight and twenty producers by production area, without identifying the individual producer. Such data is reproduced in the Table enclosed herein, entitled, United States Uncommitted Reserves Percent by Areas by Largest Producers.

We regret that we cannot disclose the detailed information submitted by individual producers pursuant to our order issued September 12, 1972, updating the nationwide investigation of proved natural gas reserves available for sale in Docket No. R–405. The Commission's order of September 12, 1972, stated that:

"2. For the purposes of this investigation no responses submitted in compliance herewith shall be made available for inspection or copying by the public; individual company information received as a result of this continued investigation will be maintained in confidental status in accordance with the provisions of Section 8(b) of the Natural Gas Act, 15 U.S.C. 717g(b), and the Freedom of Information Act, 5 U.S.C. 552(b)(4) and (9). * * *"

The results of that investigation were released to the public by the staff of the Federal Power Commission on February 22, 1973 (FPC Press Release No. 19013), and signed by the Chief of the Bureau of Natural Gas. The staff report identified the total uncommitted natural gas reserves available for sale by the 79 large producers as of December 31, 1971 and June 30, 1972, which data was further identified by producing area and segregated by non-associated and associated-dissolved natural gas volumes.

Upon review, the Commission has determined that its September 12, 1972, order assuring confidentiality of this information *cannot* be abrogated by the Commission. We believe it is our obligation to assure that the confidentiality of this data is maintained at this time and consequently should not be provided for public release as you have requested. Our conclusion is based upon our view of the obligations undertaken in the September 12, 1972 order, the authority of Section 8(b) of the Natural Gas Act and the Freedom of Information Act, particularly Sections 552(b)(4) and 552(b)(9), and finally upon review of the matter by the Office of General Counsel.

Section 8(b) of the Natural Gas Act provides:

"The Commission shall at all times have access to and the right to inspect and examine all accounts, records, and memoranda of natural-gas companies; and it shall be the duty of such natural-gas companies to furnish to the Commission, within such reasonable time as the Commission may order, any information with respect thereto which the Commission may by order require, including copies of maps, contracts, reports of engineers, and other data, records, and papers, and to grant to all agents of the Commission free access to its property and its accounts, records, and memoranda when requested so to do. *No member, officer, or employee of the Commission shall divulge any fact or information which may come to his knowledge during the course of examination of books, records, data, or accounts, except insofar as he may be directed by the Commission or by a court.*" [Emphasis supplied.]

The Freedom of Information Act, Title 5 of the United States Code, provides in Section 552(b) exceptions to the public disclosure requirements in terms as follows:

"This section does not apply to matters that are—

"(4) trade secrets and commercial or financial information obtained from a person and privileged or confidential:

* * * * * * *

"(9) geological and geophysical information and data, including maps, concerning wells."

The necessity for maintenance of the confidentiality of this proprietary information, as provided in our order dated September 12, 1972, assuring confidentiality, is grounded upon several public policy considerations. There would be an inhibiting effect upon future exploration for natural gas reserves since speculators and competitors could equally benefit with those companies willing to make geological and geophysical expenditures. A competitor would particularly benefit from knowledge of another producer's uncommitted reserves for particular locations, especially in highly competitive areas. Nor is it fair to sellers of gas to disclose such trade secrets to potential buyers with whom they may negotiate for the sale of gas. Disclosure of this data at this time on an individual company basis would deprive the producers involved of a valuable property right without due process and just compensation. It would also have an impact upon our ability to obtain similar information voluntarily from industry in the future if our orders securing information on a confidential basis are countermanded by Congressional committee action.

Similar reasons for maintaining confidentiality were also recognized by Congress in enacting the Freedom of Information Act. In reference to the exemption under Section (b)(4), House Report No. 125, 90th Cong., 1st Sess., at page 10 stated:

"It would also include information which is given to an agency in confidence, since a citizen must be able to confide in his government. Moreover, where the government has obligated itself in good faith not to disclose documents or information which it receives, it should be able to honor such obligations."

The House Report also referred to Section (b)(9) and noted the contentions of witnesses that disclosure of exploratory findings of oil companies would give speculators an unfair advantage over companies which spent millions of dollars for exploration. The Senate Report, No. 248, 90th Cong., 1st Sess., page 2, said:

"The purpose of clause (9) is to protect from disclosure certain information which is highly valuable to several important industries and which should be kept confidential when it is contained in Government records."

Sincerely,

JOHN N. NASSIKAS, *Chairman.*

Enclosure: Table entitled "United States Uncommitted Reserves Percent by Areas by Largest Producers."

[For the above enclosure, see table 1 to Mr. Nassikas' prepared statement.]

SUBCOMMITTEE ON ANTITRUST AND MONOPOLY,
JUNE 19, 1973.

Hon. JOHN N. NASSIKAS,
Chairman, Federal Power Commission,
Washington, D.C.

DEAR MR. CHAIRMAN: This will confirm your appearance at hearings before the Subcommittee on June 26, 1973, at 10:00 a.m., Room 1202 New Senate Office Building. Because of the complexity of the matters under review and the need for adequate preparation, it is essential that your testimony and accompanying submissions and responses be received no later than Friday, June 22.

With respect to the Commission's notice of proposed rulemaking to establish nationwide rates for natural gas produced from wells commenced before January 1, 1973 (Docket No. R–478), it would be most helpful for the Subcommittee to receive at the time of your appearance, a scheduled showing:

a. Using 1972 interstate pipeline sales of approximately 13.4 trillion cubic feet, state the proportion of such volumes that would be affected by nationwide rates under R–478.

b. State the volumes of natural gas now under contract that would be affected by this rulemaking.

c. State the weighted average price and range of prices of gas now flowing that would be affected by R–478.

d. State the number of contracts and the number of firms that would be affected by R–478.

Your cooperation will be appreciated.

Sincerely,

PHILIP A. HART, *Chairman.*

Senator HART. Mr. Chairman, gentlemen, we welcome you, seemingly on a harsh note, but we nonetheless welcome you.

Mr. Chairman, are you prepared to comply with the subcommittee's subpena?

STATEMENT OF HON. JOHN N. NASSIKAS, CHAIRMAN, FEDERAL POWER COMMISSION, ACCOMPANIED BY RUSH MOODY, JR., ALBERT B. BROOKE, JR., WILLIAM P. DIENER, WEBSTER P. MAXSON, EMMETT J. GAVIN, ROY FAUSSET, THOMAS J. JOYCE, LEO E. FORQUER, GORDON K. ZARESKI, PAUL J. ROOT, WARREN MORRISON, AND HASKELL P. WALD

Mr. NASSIKAS. Yes, Mr. Chairman, in fact, I have brought with me a letter and a memorandum addressed to you as chairman of the subcommittee which I would like to read for the record. I have the information you requested in your subpena duces tecum with me in these files. I will turn those over to you momentarily. The letter reads:

> Dear Mr. Chairman, pursuant to the provisions of the order of the Federal Power Commission issued June 22, 1973, Docket Number R–405, authorizing compliance with a subpena issued by the Subcommittee on Antitrust and Monopoly of the Committee on the Judiciary, June 21, 1973, the following data and documents are hereby transmitted:
>
> 1. Listing of volumes of gas with reported actual volumes of uncommitted reserves reported by two companies, which are identified by name.
>
> 2. One complete set of files from company respondents to the September 12, 1972 order in docket No. R–405.
>
> 3. One set of work papers extracting data from the files.

The covering letter is enclosed in this volume. There are three separate files and the covering letter is attached to the file, as well as a memorandum from Mr. Webster Maxson who is our executive director, as a matter of administration.

In response to your subpena, I wanted to be certain that all data and documents were supplied to the subcommittee so I have issued appropriate memoranda to all of our chiefs of bureaus to be sure that there was compliance with the scope of the subpena. I also discussed the matter with my colleagues to be certain that we supplied any relevant data in response to the subpena.

There is a second letter that I also would like to read. It is dated June 26:

> Dear Mr. Chairman, I am transmitting herewith a report of investigation conducted by the Federal Power Commission's executive director, Webster P.

Maxson, of the handling and disposition of classified data collected from producers, pursuant to the Commission's September 12, 1972 order in R–405, updating the nationwide investigation of uncommitted gas reserves. This report of investigation has been made public. It was made public this morning when it was completed.

I also transmit for your information a memorandum from Mr. Maxson listing all public documents relating to the staff study of uncommitted natural gas reserves conducted pursuant to the Commission's September 12, 1972, order.

Finally, there is transmitted herewith a further memorandum from Mr. Maxson listing all internal correspondence and memoranda relating to this uncommitted reserve study which are privileged from public disclosure under the Freedom of Information Act, but not priveleged, in my opinion, as to this committee. So that the second list is contained in this file where I place this paper and I tender this information to the committee in compliance with the subpena and also in response to various letters of the committee relating to the most unfortunate and regrettable incident wherein one of our employees, unauthorized by the Commission, attempted to have this data destroyed. Fortunately, we have the data and it has all been restored. The proximate cause of saving these documents from destruction was my action as chairman of the Commission, responding to your letter of May 18, 1973.

Senator HART. Thank you, Mr. Chairman. We will receive all of the documents which you have described as responding fully to the subpena. We will receive the investigative report which, as I recall, you said Mr. Maxson had prepared. And I am sure that will be of assistance to us as the staff of the subcommittee continues its investigation.

Today we are not going to get into the business of "who shot John" on the documents at all. But I do feel that it is unfortunate, from the standpoint of both the Commission and the subcommittee, that the events that I described and which are referred to in your Commission order had to happen as they did.

I am not talking about the document destruction. There should be a means that would avoid the necessity for the kind of—and I use the word advisedly—"harsh" confrontation between Congress and an independent regulatory agency that is reflected in the setting at the moment.

I guess that I will conclude by suggesting that this ought not be a precedent for a committee's relations with agencies, or agencies' relations with Congress.

Mr. NASSIKAS. Thank you, Mr. Chairman.

I would like to state one or two other matters here, not reading from my prepared statement, that I think are relevant to your discussion.

Much of the information that has now been supplied to the committee in response to the subpena, was previously supplied by the Commission's staff as the result of private interrogations of the staff by the staff of your subcommittee, which was authorized by myself as chairman with the consent of my colleagues, so that the committee could determine as best it can, in its own judgment, as to the events which transpired.

I think that Mr. Maxson's investigative report will be of material assistance to the subcommittee.

Next, I would like to state that I don't consider this, Mr. Chairman, as a harsh confrontation. The only reason that I could not respond to the request of your subcommittee, without a subpena, was that I believed that turning over documents voluntarily on committee request would violate Commission orders which would then, of course, subject me as chairman to violation of statutes enacted by the Congress of the United States.

However, when a subpena was issued, upon examining the law, it was determined, as our order of June 22, 1973 reads, that the subpena of the subcommittee should be honored and I appreciated particularly the attitude of my colleagues in securing a revised order which would make it possible for us to accommodate the committee's purposes.

The final point I would like to make is that I have every faith and confidence that your subcommittee will honor and respect the public interest, as you see it, just as the Federal Power Commission has honored the public interest, as we see it, under the regulatory statutes, as determined by the courts.

I have one final letter to give you in response to your letter to us.

On June 19, in response to your letter of June 19 concerning the Commission's pending rulemaking in docket R–478, nationwide rulemaking to establish just and reasonable rates for natural gas produced from wells commenced before January 1, 1973—that is old or flowing gas—I have attached a staff memorandum in answer to your inquiry. I have it here. If you wish it, I will present it to a member of your staff at this time.

Senator HART. We do.

Mr. NASSIKAS. Thank you, Mr. Chairman.

Senator HART. Let me order that your prepared statement be printed in full in the record.

As you go along, if there is any summation that you want to make, or if there are any additions, feel free to make them.

[The prepared statement of Mr. Nassikas follows. Testimony resumes on p. 72.]

PREPARED STATEMENT OF JOHN N. NASSIKAS, CHAIRMAN, FEDERAL POWER COMMISSION

Mr. Chairman, as requested in your letter of May 18, 1973, as supplemented by your letter of May 22, 1973, I am pleased to submit my statement on the nature and extent of competition and concentration in the natural gas industry.

COMMISSION RESPONSE TO THE NATURAL GAS CRISIS

There is a pervasive and deepening gas supply crisis in the United States. For the last five successive years, we have produced twice as much gas as we have found and our reserves in the lower 48 states have declined by 54.7 Tcf.[1] Over the last decade the domestic gas reserve-to-production ratio for the lower 48 has been cut in half to a current ratio of about 10.

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[1] As reported by the American Gas Association.

COMPARISON OF AGA AND FORM 15 DATA (LOWER 48 STATES)

[Volumes in trillions of cubic feet]

	End of year reserves		Reserve to production ratio		Finding to production ratio	
	AGA	Form 15	AGA	Form 15	AGA	Form 15
1963	274.5	188.5	18.9	20.2	1 2	N/A
1964	279.4	189.2	18.3	18.9	1.3	1.1
1965	284.5	192.1	17.5	18.5	1.3	1.3
1966	286.4	195.1	16.4	17.5	1.1	1.3
1967	289.3	198.1	15.7	16.8	1.1	1.2
1968	282.1	195.0	14.6	15.5	.6	.8
1969	269.9	187.6	13.1	14.0	.4	.5
1970	259.6	173.6	11.9	12.3	.5	.0
1971	247.4	161.3	11.3	11.4	.4	.1
1972	234.6	(1)	10.4	(1)	.4	(1)

[1] Not available.

Unless we can more than double the ten-year average finding rate of 17 Tcf experienced during the 1960's (sharply reversing the average annual finding rate for 1968–72 of 10 Tcf) the Commission's Bureau of Natural Gas projects an unsatisfied level of demand for gas of 3.6 trillion cubic feet in 1975, with a widening supply shortfall in the period beyond 1975 and anticipated supply deficiencies of 9.5, 13.7 and 17.1 trillion cubic feet in 1980, 1985, and 1990, respectively, despite the addition of supplemental gas sources to domestic production of natural gas in the lower 48 states.[2]

On May 17, 1973, the Federal Power Commission staff issued the first independent government appraisal of proven recoverable U. S. gas reserves as of the end of 1970. The results of this staff study were 261.6 trillion cubic feet of proven recoverable reserves (including Alaska and the offshore area), compared to the 286.7 trillion cubic feet reported by the American Gas Association for the comparable 1970 year-end period. Thus, our inventory of proven gas reserves is even less than was originally estimated.

Since 1956, when drilling for oil and gas in this country reached a peak, the number of wells drilled annually has trended generally downward while the average depth per well has been increasing.[3] In 1956, a total of 57,170 wells were drilled, compared to 26,784 in 1970, a decline of about 53 percent. During this same period, the average depth of all wells increased almost 25 percent, from 4,080 feet to 5,076 feet. Total gas well drilling reached a peak in 1961, when 5,459 were completed. Since 1961, there has been a generally declining trend in the number of gas wells drilled, reaching a low point in 1970 of 3,225 gas wells drilled or a decline of about 41 percent. Since 1961, the average depth of gas well completions increased from 5,345 to 6,149 feet. Oil drilling activity has remained relatively constant over the last three years and substantially below levels of ten and fifteen years ago, which trends impact upon the level of gas reserve additions inasmuch as about one-fourth of our gas reserves have historically been found as a result of the directional search for oil. However, there are encouraging signs on the horizon, even today. There was an increase of 23 percent in the number of gas wells drilled in the first three quarters of 1972, compared to the same period in 1971, and a 19 percent increase in exploratory gas-well footage. It has been reported that drilling and production budgets for 1973 have increased 7 percent compared to 1972. Total wells drilled are still about one-half the level of 15 years ago, while net gas production over the same period has approximately doubled.

Interstate pipelines have curtailed and are curtailing both firm and interruptible gas service with widespread adverse economic, social and environmental results. Direct industrial sales declined about 12 percent in 1972. For the April 1972–March 1973 period, fifteen major pipelines have reported deficiencies of about one trillion cubic feet or about 10 percent of the annual sales of those pipelines representing almost five percent of total annual domestic gas production. This represents a sharp increase from reported deficiencies of 453 billion cubic feet for the April 1971–March 1972 period.

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[2] The staff estimate posits net pipeline imports of 1.6 Tcf in 1980 increasing to 1.9 in 1990, LNG imports of 2 Tcf in 1980 doubling to 4 Tcf in 1990, gas from coal at a level of 0.3 Tcf in 1980 increasing to 3.3 Tcf in 1990, and gas from Alaska at .7 Tcf in 1980 and 2.3 Tcf in 1990.

[3] *National Gas Supply and Demand 1971–1990, Staff Report No. 2,* prepared by the Commission's Bureau of Natural Gas, p. 134, February 1972.

Our staff estimates that we have domestic proven potentially recoverable gas resources adequate to meet future demand growing at the rate of about one and four-tenths percent ($1\frac{4}{10}\%$) annually for 65 years. A recent Potential Gass Committee report estimates we have 1146 trillion cubic feet of potential gas resources as of December 31, 1972, about 230 trillion cubic feet (20 percent) of which are located in the offshore areas and 366 trillion cubic feet (31 percent) in Alaska.

I have summarized in Appendix A the numerous actions taken by the Federal Power Commission to reverse this gas supply shortfall and to restore adequate and reliable gas service to the Nation's gas consumers. However, this Subcommittee should be cognizant of the limitations of the Commission's power to effectuate a reversal of past trends. For instance, about two-thirds of the annual domestic natural gas production (which is the amount purchased and produced by interstate pipelines) is subject to Commission regulation. With respect to independent natural gas producers, the Commission can neither compel a producer to explore and develop nor to dedicate discovered gas reserves to the jurisdictional market.[4] A producer needs no certificate of public convenience and necessity to either begin or cease exploratory and developmental activity. Traditionally cost-of-service regulation is in many respects inapposite to public utility regulation of independent producers.

Within our jurisdictional responsibilities, the Commission has initiated numerous innovative measures to obtain additional reserves for jurisdictional consumers. Short-term emergency purchases, ranging from 60 days to three years, at above area ceiling rates have been authorized under our Order No. 431[5] procedures resulting in commitments to interstate consumers of about 1.2 trillion cubic feet.[6] Under our optional certification procedure,[7] four long-term commitments have been made of about 285 billion cubic feet and about 35 applications are now pending with gas volumes aggregating over three trillion cubic feet. As of May 1, 1973, pipelines had advanced almost $1 billion to producers in return for drilling commitments and gas dedications under an advance payments program authorizing recovery of advances by pipelines to producers for exploration and development.[8]

In addition, this Commission has taken significant policy initiatives to stimulate competition in the exploration and development of natural gas. Under Order No. 428,[9] the Commission exempted over 4000 small producers from area price ceilings, as an incentive to stimulate greater exploration and development, recognizing the relative higher degree of risk associated with their activities, the capital needs and accessibility of this group and comparatively greater regulatory burdens.[10] The Commission adopted a policy of placing pipelines on a parity with producers, as to sales by pipeline-producing affiliates, so as to increase competition and provide incentives for new entrants into the production segment of the industry.[11] In recognition of the particular structure of the purchasing segment of the gas industry in certain areas of the country, this Commission has prescribed minimum area rates, irrespective of the existing contract levels,[12] so that exploration and development by producers would not be retarded. By our Order No. 453, we are collecting price and quality data of fossil fuels purchased by the electric utility industry, which data is disclosed to the public and concerned federal agencies. *National Coal Assn.* v. *F.P.C.*, D.C. Cir., No. 72–1919.

While this Commission has acted to foster competition in the gas industry, as part of its initiatives to alleviate the chronic shortage of deliverable and recoverable gas resources, there are other constraints impacting upon such policies, including government leasing and tax policies, inadequate capital formation, the requisite investment in exploration and development, environmental air, water and land use standards and regulations, and Economic Stabilization programs. Government leasing practices are particularly important inasmuch as about one-half our potential gas and oil resources are located on federal onshore and offshore lands. The present high bonus bidding plus a fixed royalty erects comparatively high entry barriers for small producers to obtain leases. I have advocated on numerous occasions that prompt consideration should be given to change the present practices to a relatively modest bonus plus royalty bidding for leasing of government lands. This would increase competition in the leasing of government lands and capital would be utilized for exploration and development, rather than for bonus bidding.

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[4] See *Permian Basin Area Rate Cases,* 390 U.S. 747, 756–757 (1968).

[5] 45 FPC 570 (1971).

[6] From 1971 through May 1973, 226 limited-term certificates were issued for volumes of 791.8 Bcf at prices ranging from 30–45 cents per Mcf. From 1970 through May 1973 442 60-day emergency purchases were initiated at prices ranging from 35–45 cents per Mcf volumes of 385.4 Bcf.

[7] Appeal docketed *John E. Moss, et al.* v. *F.P.C.*, No. 72–1837, D.C. Cir.

[8] Order No. 410, 44 FPC 1142 (1970), affirmed *P.S.C. of N.Y.* v. *F.P.C.*, 467 F.2d 361 (D.C. Cir. 1972). About $600 million in advance payments were made in the lower 48 states to which about 95 trillion cubic feet of reserves may be attributed.

[9] 45 FPC 454 (1971), reversed *Texaco, Inc.* v. *F.P.C.,* 474 F.2d 416 (D.C. Cir. 1972), petition for certiorari pending.

[10] E.g. *Permian, supra*, 390 U.S. at 787.

[11] Affirmed *City of Chicago* v. *F.P.C.,* 458 F.2d 731 (D.C. Cir. 1971), cert. denied 405 U.S. 795 (1972).

[12] Minimum rates have been established for the Hugoton-Anarkarko area, 44 FPC at 778, affirmed *California* v. *F.P.C.*, 466 F.2d 974 (9th Cir. 1972), the Rocky Mountain area; Opinion No. 658, April 11, 1973, and the Permian Basin area; *Permian surpa.*

HISTORICAL SUMMATION OF JUDICIAL FINDINGS CONCERNING PRODUCER REGULATION AND INDUSTRY COMPETITION

In the original proceeding which resulted in FPC regulation of independent producers, *Phillips Petroleum Co.*, 10 FPC 246 (1951),[13] the Commission principally addressed the issue of FPC jurisdiction over independent producers in light of the language of the Natural Gas Act and related court decisions. In denying that it had jurisdiction over independent producers, the Commission treated the issue of competition only in passing:

"A contention is also advanced that a failure to find jurisdiction leaves Phillips free to charge unreasonable rates, the burden of which will fall on ultimate consumers. Since we have failed to find jurisdiction, *we have of course not inquired into the reasonableness of Phillips' rates*. But if it be assumed they are or will become unreasonable, we can only say to those who would have us find jurisdiction, what has often been said by the courts, that we think the remedy lies with Congress." (Emphasis supplied) [14]

The Court of Appeals for the District of Columbia reversed the decision of the Commission,[15] not on an evaluation of competition among natural gas producers but upon the construction to be given to the Natural Gas Act:

"But the validity or invalidity of the Commission's conclusion that Phillips is not a 'natural gas company' does not turn upon the evaluation of testimony or upon any facts peculiar to this case. It turns upon the generic question whether the exemption of 'production or gathering' in § 1(b) of the Natural Gas Act covers interstate sales of gas by the corporation that produced and gathered it." [16]

The Supreme Court affirmed the Court of Appeals decision,[17] and in so doing brought independent producers of natural gas under regulatory control of the FPC. However, the Supreme Court, like the Court of Appeals, was ruling on a matter of law, rather than upon a particular fact situation in which the issue of workable competition might or might not have been a consideration.

"In our view, the statutory language, the pertinent legislative history, and the past decisions of this Court all support the conclusion of the Court of Appeals that Phillips is a 'natural gas company' within the meaning of that term as defined in the Natural Gas Act, and that its sales in interstate commerce of natural gas for resale are subject to the jurisdiction of and regulation by the Federal Power Commission." [18]

The Commission first attempted to implement the *Phillips* decision by treating producers as individual public utilities and thereby to set limits on the field prices of an individual producer according to his "costs of service." This approach soon proved so administratively burdensome because of the large number of producers that resort was had to the determination of area-wide ceiling prices. Individual producers within each gas production area would not be allowed to charge a rate higher than the prevailing area ceiling.

In the Permian Basin Area Rate Proceeding [19] certain producers contended that contract prices negotiated at arms length should be the standard for determining area prices. The Commission rejected this argument, stating:

"There are admittedly many producers selling gas to the interstate pipelines both in the nation as a whole and the Permian Basin in particular, but nothing in this record suggests that any competition among them in making sales to the pipelines is in any way adequate to assure that the public will secure gas at just and reasonable prices in the absence of regulation." [20]

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[13] *Reversed sub. nom. Wisconsin* v. *FPC*, 205 F.2d 706 (D.C. Cir. 1953) *affirmed sub. nom. Phillips Petroleum Co.* v. *Wisconsin*, 347 U.S. 672 (1954).

[14] 10 FPC at 280.

[15] *Wisconsin* v. *FPC*, 205 F.2d 706 (D.C. Cir. 1953).

[16] *Id.* at 711.

[17] *Phillips Petroleum Co.* v. *Wisconsin*, 347 U.S. 672 (1954).

[18] *Id.* at 677.

[19] 34 FPC 159 (1965), *aff'd in part and rev'd in part sub. nom. Skelly Oil Co.* v. *FPC*, 375 F.2d 6 (10th Cir. 1967), *reversed,* in re *Permian Basin Area Rate Cases*, 390 U.S. 747 (1968).

The Commission was particularly concerned with the amount of uncommitted reserves controlled by the large producers insofar as it related to effective competition in the Permian Basin. The pattern of sales and annual deliveries in the area suggested to the Commission that a small number of producers controlled a large percentage of reserves, especially as no evidence to the contrary had been introduced by the producers themselves.[21] The Commission thus concluded:

"If there is a case to be made for effective competition among producers in establishing just and reasonable rates it has not been made on this record. There is no evidence of competition between producers to make new sales by offering lower prices. On the contrary the primary competition revealed by the record was among the pipelines to secure new gas supplies at higher prices. Whatever the degree of competition which may exist among producers it has not been effective to afford gas consumers the protection to which they are entitled under the Natural Gas Act." [22]

In affirming the Commission's opinion the Supreme Court stated that "[T]he record before the Commission, however, supports its conclusion that competition cannot be expected to reduce field prices in the Permian Basin to the 'lowest possible reasonable rate consistent with the maintenance of adequate service in the public interest.' *Atlantic Rfg. Co.* v. *Public Service Comm'n.*, 360 U.S. 378, 388." [23] However, the Court was careful to avoid any pronouncement that the lack of competitiveness evidenced in the Permian record was characteristic of the entire industry. At page 795 of its decision, the Court said:

"We do not now hold, and the Commission has not suggested, that field prices are without relevance to the commission's calculation of just and reasonable rates under § 5(a). The records in subsequent area proceedings may more clearly establish that the market mechanism will adequately protect consumer interests. We hold only that, on this record, the Commission was not compelled to adopt field prices as the basis of its computations of area rates."

In its opinion in the initial Southern Louisiana Area Rate Proceedings,[24] the Commission again rejected a contention similar to that advanced in *Permian*, to wit, that an effectively competitive interstate market for natural gas existed in the Southern Louisiana production area and that the Commission's statutory responsibility for establishing just and reasonable rates could be discharged by a validation of the negotiated contract prices. The Commission found the history of price negotiations, the relative bargaining power of pipeline purchasers, and control of uncommitteed reserves in Southern Louisiana to be indicative of "serious market imperfections which preclude us from relying upon the free operation of the market, as evidenced by arms-length bargaining, to protect the ultimate consumer from unreasonable purchased gas rates." [25]

The Commission made clear that its conclusion of inadequate competition was assessed "as the facts of that competition in Southern Louisiana are shown in the record." [26] No intimation was made that structural noncompetitiveness was characteristic of the producer industry in general.

Indeed, the Fifth Circuit Court of Appeals, in affirming the Commission's decision in the Southern Louisiana rate cases,[27] observed:

"At the same time, there seems to be general agreement that the market is at least structurally competitive. The Supreme Court in *Permian* described producers as 'intensively competitive'. 390 U.S. at 757, 88 Ct. at 1354." [28]

Commission decisions and applicable court opinions have not determined that the market structure of the natural gas producing industry is not workably competitive. Nor do prior judicial decisions rebut or undermine the presumption that the structure of the natural gas producing industry as a whole is workably competitive; a presumption which is proper without a preponderance of evidence to

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[20] 34 FPC at 181.

[21] I would note, parenthetically, that the Commission in Permian shifted the burden of proving the existence of workable competition to the producers. This was appropriate in the context of an adjudicatory proceeding, since producers had argued that field prices should be the measure of an area ceiling and thus the burden of persuasion shifted to them to support their contention.

[22] 34 FPC at 183.

[23] *Permian Basin Area Rate Cases*, 390 U.S. 747, 792 (1968).

[24] 40 FPC 530 (1968), *affirmed on review*, SLA Rate Class (*Austral Oil Co.* v. *FPC*), 428 F.2d 407 (5th Cir. 1970), *on rehearing*, 444 F.2d 125 (1970), *cert. denied sub. nom.*, 400 U.S. 950 (1970).

[25] 40 FPC at 554.

[26] 40 FPC at 552.

[27] *Southern Louisiana Area Rate Cases* (Austral Oil Co. v. F.P.C.) 428 F.2d 407 (5th Cir. 1971).

[28] *Id.* at 416 n. 10.

the contrary. The decision to bring independent producers within the regulatory ambit of the Federal Power Commission was based on a construction of statutory language in the Natural Gas Act,[29] and not upon an evidentiary showing of anticompetitive behavior or structural market inperfections within the producer segment of the industry.

COMPETITION IN THE NATURAL GAS PRODUCING INDUSTRY—ECONOMIC CONSIDERATIONS

As the foregoing section has demonstrated, there is no basis in the *law* from which one can determine that the absence of workable competition among gas producers forms a predicate for continued wellhead price regulation under the Natural Gas Act. Thus, I would like to outline some *economic* considerations from which one can reach certain conclusions, albeit not definitive, respecting competition in the natural gas producing industry.

Perfect competition is an economist's term, the definition of which is irrelevant to pragmatic economic life. Workable competition, on the other hand, normally envisions a situation where no one seller or group of sellers acting in concert has the power to choose its (their) level of profits, either by giving less or charging more. Under these circumstances, market conditions penalize poor service and high costs. Prices are determined by supply and demand and not by a seller's own price or individual output.

In looking at the "seller rivalry" in any particular market, one must normally consider that the "market" would encompass all firms whose products are in fact directly available substitutes and including, in other industries, alternatives for the same end use. By the year 2000, the electric utility industry is expected to be consuming about one-half our primary energy sources." [C]oal, oil, natural gas, and uranium are sufficiently substitutable in their use by electric utilities to support the conclusion that they trade in the same economic market." [30] "The increased substitutability causes an increase in the size of the market, and thereby tends to reduce concentration levels, erode existing market power, and promote competition." [31] In my opinion, there is credible evidence that the decisions of sellers in the natural gas producing industry, in terms of price and output, cannot be made in isolation from fuel prices and output in the larger energy market. While many of these same natural gas sellers likewise participate in other energy sectors, in quantitative terms, their market power is probably diminished.

The considerations which I outline *infra* are largely limited to natural gas production. To this extent there are severe limitations in the conclusions which can be drawn therefrom. However, I view the evidence of increasing fuel substitution as a *positive* influence upon workable competition in the gas production industry both now and for the longer term.

There are numerous factors which may be considered in analyzing workable competition including (1) the number of effective competitive sellers, (2) ease of entry, (3) independence of rivals, (4) industry's rate of growth, (5) excess capacity, (6) existence of predatory pricing, (7) product differentiation, (8) meeting rival's prices, and (9) price discrimination.[32] Certain of these factors may be more important than others and certain ones are not particularly germane to the gas production industry.

With respect to price discrimination (9), meeting rival's prices (8), and predatory pricing (6), the Commission regulates the wellhead price for about two-thirds of the annual domestic output, thereby replacing normal market-determined pricing conditions. Under traditional producer area rate decisions, maximum ceiling prices (minimum prices in certain producing areas, *supra.*) are established, representing the maximum rate a seller may receive if he is contractually authorized. Since such a ceiling price represents a composite of average costs, those producers with higher-than-average costs, including the less efficient firms, as well as those who are forced to drill deeper or otherwise divert their efforts toward the higher cost-higher-risk leaseholds, would have a disincentive to explore and develop marginal reserves. Those producers who are unable to command a price higher than the maximum area ceiling will most likely direct their efforts toward those reserves having marginal costs less than such prices. There may be uniformity, in at least the prices of new contract gas volumes, in particular producing areas, but this is in response to governmental price regulation. In other words the marketplace has not been free to determine the price of gas with reference to its economic value, marginal costs, or commodity value in relation to substitutable fuels.

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[29] *Phillips Petroleum Co. v. Wisconsin*, 347 U.S. 672 (1954).

[30] "Interfuel Substitutability in the Electric Utility Sector of the U.S. Economy", Economic Report to the Federal Trade Commission, February 1972 at 113.

[31] *Id.* at 119.

[32] See Report of Attorney General's Antitrust Committee 315–342 (1952) and Caves, *American Industry: Structure Conduct, Performance* 16–36 (1967).

In conjunction with these prices considerations, it should be noted that the industry has not been able to exercise market power so as to exact excessive profits. While it is speculative to attempt to quantify profit realization of the gas production functions of an integrated and diversified firm (which the majority of the large gas producers are), the average rate of profit on stockholder's equity for petroleum refining and related industries for the 1961–1971 period was 11.4 percent, as compared to an 11 percent rate for all manufacturing industries for the same period.[33]

The gas industry's rate of growth (4) has likewise not been solely market determined. Domestic production has remained relatively constant over the last three years at about 22 trillion cubic feet annually. However, over the longer term, gas production exhibited above average growth, increasing from 5 trillion cubic feet annually in 1946, to the current level of 22 trillion cubic feet. However, the demand, as contrasted with output, for gas has continued to increase. Environmental considerations influence the demand for gas, as well as the economic accessibility of other fuels. A conservative estimate indicates requirements for natural gas in 1975 of 28.5 trillion cubic feet; however, only about 86 percent of those requirements are expected to be satisfied.[34] In short, while gas demand continues to increase, the ability to produce sufficient supplies has decreased, for a variety of reasons, including price regulation and the decline in domestic oil exploration and drilling. Because gas is the cleanest burning of all fossile fuels and therefore meets air quality standards, the greatest increase in requirements of natural gas might be expected for power generation by electric utilities and other large boiler fuel users. However, in order to allocate scarce supplies to the most efficient and highest uses, the Commission has sought to discourage the use of gas for boiler fuel. The success of our end-use policy is largely contingent upon the price and availability of alternate environmentally acceptable fuels. If we are successful in substantially reducing boiler fuel use, the availability of gas supplies for more superior uses will be materially augmented.

As for excess capacity (5), there is of course a pervasive shortage of deliverable gas resources. There appears to be an absence of excess productive capacity when compared to current demand requirements. However, in absolute terms, there are large untapped potential gas resources (see *supra.*), the accessibility to which is constrained by numerous factors, including economic and environmental considerations. Additionally, there are numerous factors which affect the rate at which reserves are withdrawn, including economic constraints on available transportation facilities and applicable conservation regulations. To the extent production continues to lag, interstate pipelines may have excess capacity, which can result in higher unit pipeline costs which will be passed on to consumers as facilities in service are not fully utilized.

Product differentiation (7) is largely absent inasmuch as gas in a homogeneous commodity, with only minor differences in quality. The homogeneity of the product tends to widen the prospective market.

In sum, the six factors discussed above are either not particularly germane or exhibit a *positive* influence on maintaining and increasing workable competition in the gas production segment.

Each natural gas producer tends to follow his own personal advantage and there exists an independence of rivals (3). The extensive capital requirements for exploration and development have resulted in producers combining together whether it be for point bidding for offshore leases or unitization for development of a particular gas field or resevoir. Such concert in action results not from aticompetitive pursuits, but from risk-sharing and the substantial bonus bids required under present leasing practices, regulations concerning compulsory unitization and state conservation regulations.

Barriers to entry in the exploration and development for natural gas are relatively low in comparison with other industries (2). Capital requirements are modest for onshore activities. Current leasing practices may be erecting entry barriers, as bonus bidding increases, particularly to the small, nonintegrated producer. Past pricing decisions of the Commission may have deterred the entry of new firms not engaged in gas exploration and development and retarded the expansion of existing firms. While there is a high degree of risk, there are certain offsets from existing tax laws. Finally, the emergence of non-conventional gas supplies, largely through backward integration by gas distributors and pipelines, exerts a positive influence and constrains the market influence of gas producers. For instance, with very short lead times and modest capital requirements, a firm may construct an operational synthetic natural gas plant. Imports, whether pipeline or liquefied natural gas, likewise influence pricing decisions of domestic gas producers. Coal gasification also has an impact; however, the capital required restricts the entry to at least the medium-sized firm.

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[33] *Quarterly Financial Report for Manufacturing Corporation,* Securities and Exchange Commission-Federal Trade Commission.

[34] *Future Gas Requirements of the U.S.,* Vol. 4, October 1971 at 11.

The number of effective competitive sellers (1) is normally viewed as the single most important variable in gauging the existence or absence of workable competition. There is no doubt as to its importance, but any such analysis must not disregard the individual and cumulative impact of other factors, some of which I have outlined *supra*.

There are about 4500 independent natural gas producers in the United States. Indications are that in absolute terms, this probably represents a decrease compared to ten or twenty years ago. However, the decline could represent the disappearance of the less efficient or consolidation and merger among the smaller producers so as to obtain access to capital markets. The size and strength of the individual sellers of natural gas varies, as is the case in virtually all industries. In order to quantify the relative size and strength, "concentration ratios" are normally used. I have attached tables which illustrate concentration ratios for annual sales (Table 2), new contract volumes (Tables 3a and 3b), uncommitted reserves (Table 1), and pipeline reserves (Table 4) and production (Table 2). Any judgments to be drawn from such exhibits are conditioned to the assumptions underlying the calculations. Inasmuch as the relevant product market has many attributes of fuel substitutability, concentration ratios for natural gas by itself may be meaningless. The pipeline transportation grid is national, so that regional markets may be irrelevant. In short, the smaller the market assumed and the tighter geographic area which is circumscribed, generally the higher the concentration ratios. There is, thus, a great deal of "artificiality" in constructing such a quantitative presentation and any given economist or group of economists could spend generations arguing over the appropriate conclusions which decision-makers should draw therefrom. I know that your Subcommittee will remain cognizant of these caveats.

In assessing concentration ratios, one source gives some indices for further assessment.[35] Generally, this theory postulates that the top eight firms should control about 50 percent of the market before further inquiry is needed to determine the existence of a structural oligopoly.

Table 2 shows the percent of sales by large producers (over million Mcf annually) to interstate pipelines for 1971. Information on intrastate producer sales, representing about one-third of annual domestic production, is unavailable The top 4 producers accounted for about 25 percent of jurisdictional sales to interstate pipelines in 1971; the top 8 producers, about 43 percent. Ten producers made about one-half of the 1971 sales to interstate pipelines and 300 producers accounted for about 95 percent. On the buying side, the top 4 pipelines accounted for about 36 percent of the purchases and the top 8 pipelines, about 58 percent (Table 2). Within separate producing areas, to the extent they are geographically relevant, concentration ratios would be somewhat higher. For instance, in South Louisiana in 1968, the top 4 producers account for about 35 percent of the sales to interstate pipelines; the top 8 producers, slightly over 50 percent.[36] On the purchasing side, in South Louisiana, the top 4 pipelines purchased about 60 percent of the production; the top 8 pipelines about 90 percent. On a national basis, there appears to be an absence of structural imperfectious, which in my opinion would indicate that workable competition does exist, at least among sellers, using concentration ratios of annual production. Table 5 illustrates the numerous manufacturing industries with *higher concentration* ratios than exist in gas production and such industries are not subject to direct government price regulation.

Some economists on the Commission's staff have performed analyses of concentration ratios based upon new contract volumes, contending this is the relevant market since it represents the volumes available for sale in any given year.[37] A comparable thesis supports an analysis based upon uncommitted reserves.[38]

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[35] Kaysen and Turner, *Antitrust Policy* (1959).

[36] Joint Economic Committee Hearings, *infra.* at 125–126.

[37] E.g. Joint Economic Committee Hearings, June 8, 1972, Committee Print at 124 and 148.

[38] *Id.* at 149.

However, both these studies have major shortcomings. For instance, as of June 30, 1972, the Commission's staff reported uncommitted reserves available for sale in the lower 48 states of 3.4 trillion cubic feet.[39] Concentration ratios for the top 4 and top 8 of that 3.4 trillion cubic feet were 48 percent and 68 percent, respectively, on a national basis, and ranged as high as 100 percent for less than 4 producers in certain specific pricing areas (Table 1). However, these figures are erratic, representing circumstances as of a single point in time. Gas exploration and marketing are continuing activities which cannot be meaningfully analyzed as of a single point in time. Such figures should and do vary dramatically (e.g., Tables 6a, b and c), depending upon the selection of the time for measurement. They are, however, misleading for purposes of analyzing workable competition. On the other hand, if uncommitted reserves were averaged over a reasonable timeframe, e.g., three to five years, one would anticipate concentration ratios which would parallel those for new contract volumes (Table 3b), which latter ratios are comparable to those for annual production (Table 2).

Uncommitted reserves represent only a small fraction of total domestic proved reserves for the lower 48 States, about one and one-half percent. The aggregate volumes of uncommitted reserves has declined from 4.6 trillion cubic feet as of December 31, 1969, to 3.8 trillion cubic feet as of December 31, 1971, to 3.4 trillion cubic feet as of June 30, 1972. The more of these reserves which are contracted for and dedicated to pipelines, the more the base of uncommitted reserves decreases with a consequential increase in the concentration ratios at any point in time. For instance, Table 1 indicates that fewer than 4 producers accounted for all the uncommitted reserves of about 3.5 billion cubic feet in the Michigan area as of December 31, 1971, but that as of June 30, 1972, there were no uncommitted reserves reported for Michigan. It is inconceivable to conclude therefrom that on December 31, 1971, a seller's monopoly existed in Michigan, when during the subsequent six months the sale of those reserves was contracted for. Thus, concentration ratios of uncommitted reserves are inextricably related to the shortage deliverable gas reserves, which shortage had been indicated for a decade or more, and are not a reflection of any market imperfections.

The actual volumes available for sale may also differ from "uncommitted reserves." For instance, in South Louisiana, 2.6 trillion cubic feet was determined by our staff to be the level of uncommitted reserves as of the end of 1969; however, only 1.1 trillion cubic feet was available for sale, after consideration of volumes under warranty contracts, for fuel and feedstock and for direct sales.[40]

More importantly, utilization of new contract volumes or uncommitted reserves does not reflect the volumes actually available for that purpose. There are gas reserves available for sale, whether through new contracts or renegotiation, from the expiration of existing flowing gas contracts. A staff estimate is that gas reserves remaining after 1972 from contracts expiring that year approximated 2.5 trillion cubic feet nationally.[41] Thus, adding gas reserves released from contract to other uncommitted reserves, the gas volumes available for sale as of June 30, 1972, would be closer to 6 trillion cubic feet, rather than 3.4 trillion cubic feet. While not mooting any conclusions to be drawn from concentration ratios of the uncommitted reserve volumes, a more credible appraisal of concentration ratios in relation to market structure should include the volumes of reserves available upon expiration of flowing gas contracts.

Table 3b shows the concentration ratios for new contract volumes in South Louisiana for the period 1967–1969, indicating the top 4 with 29 percent and the top 8 with 45 percent. Table 1 shows that the top 4 firms accounted for about 50 percent of the uncommitted reserves in the offshore South Louisiana area as of June 30, 1972, and the top 8, about 75 percent. On a national basis, the top 4 firms accounted for 50 percent of the June 30, 1972 uncommitted gas reserves and the top 8 about two-thirds. A fair conclusion which can be drawn from these tables, recognizing their limitations as mentioned *supra.*, is that nationally, there are no structural imperfections as measured by either new contract volumes or uncommitted reserves. As indicated in Tables 6a, b and c, and referring to the South Louisiana area (Table 6a), a staff turnover analysis indicates that there were *no* producers who were among the top 8 sellers in all six years, 1964–1969. Such a high turnover rate also is found in the new contract volumes in other producing areas (Tables 6b and c). These turnover statistics are further evidence of the inability of a few producers to control the new contract volumes of gas offered for sale and hence the absence of market power. There may be, and certain data so indicates, that relatively high concentration ratios of either new contract volumes or uncommitted reserves do exist in certain individual producing areas; however, I cannot conclude therefrom that the overall natural gas producing industry is structurally anticompetitive.

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[39] FPC Press Release No. 19013, February 22, 1973.

[40] 46 FPC at 638 (1971).

[41] Assumptions used in making such an estimate are as follows: (1) 1952 contracts have a 20-year term, thus expiring in 1972, (2) 1971 sales volumes under those 1952 contracts equal 2.84 percent of total recoverable gas reserves, using the production curve in the Permian proceeding, Docket No. AR61–1, and (3) gas reserves remaining after 1972 from those 1952 contracts equals 15.12 percent of total recoverable gas reserves, using the same production curve.

Table 4 shows the reserves dedicated to interstate pipelines which represent about two-thirds of the total U.S. proved natural gas reserves as reported by the American Gas Association. In 1970 and 1971, the top 4 accounted for between 41 and 43 percent of those dedicated reserves: the top 8 interstate pipelines between 63 and 65 percent. One must recognize that even if there are structural imperfections on the producing side of the market, there may be some offset via the concentration ratios on the purchasing side, even in times of a supply shortage.

CONCLUSION

From my analysis, I would conclude that there is credible evidence to support the thesis that workable competition exists in the natural gas producing industry. Those who would advocate continued regulation have not sustained the burden of presenting evidence, that on a national basis, the industry is not workably competitive. I further find no evidence of anticompetitive conduct by producers vis-a-vis the structure of the industry. I recognize there is some evidence of structural imperfections in the industry, but not to the extent that deregulation of new gas prices, wih appropriate monitoring and safeguards against anticompetitive conduct in any market area, should not be tried on an experimental basis, through legislation by the Congress, in order to establish prices through the operation of the laws of supply and demand in an intercompetitive fuels market.[42]

Past Commission producer pricing practices have, in my opinion, been antithetical to the overall public interest. Excessive volumes of gas have been diverted from jurisdictional consumers to intrastate markets, including the combustion of large volumes to generate electricity, when alternate fuels could have been utilized. More and more risk capital is being committeed to nonconventional gas sources as prices to the consumer double or triple the price levels from traditional domestic sources of pipeline gas. Low gas prices have significantly contributed to artificial demands for this premium fuel, and as supplies have declined, demand and upward price pressures have shifted to other fuels. Drilling activity in our continental resource base, both for oil and gas, has declined, with balance of payments and national security considerations becoming more important as increasing quantities of oil are imported to meet consumer needs. I submit that the "costs" to the Nation's energy consumers from continued regulation may be far greater than would result from a market-clearing price for natural gas determined by the impersonal forces of the marketplace appropriately monitored by antitrust enforcement by the Justice Department and the Federal Trade Commission.

The attainment of the Nation's economic, social and environmental objectives will not be met by adhering to past energy policies, including unrealistic pricing of wellhead prices of natural gas. Congress should expeditiously consider legislation which would return to the markeplace the responsibility for setting wellhead prices of new gas. However, until Congress has amended the Natural Gas Act, we will continue to regulate within the constraints imposed by the Congress and the judiciary.

* * * * * * *

APPENDIX A

Actions by the FPC to Increase Exploration and Development and the Dedication of New Gas Supplies to the Interstate Market and to Alleviate Short-Term Gas Shortage Emergencies

I

On October 3, 1969, in Opinion No. 567, the Commission revised its area rate policy to encourage the search for gas in reservoirs which underlie acreage already committed to the interstate market. Potential gas bearing sedimentary rocks up to 40,000 feet in thickness occur in the deepest basins. A large portion of the sediments below 5,000 feet remain untested. The new policy provides that under the two-price system, with higher rates for new gas-well-gas to encourage exploration, production from newly discovered reservoirs on previously dedicated acreage would be allowed the price it would have if the contract had been dated concident with discovery.

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[42] See Interview of Assistant Attorney General Thomas E. Kauper, reported at BNA–ATRR, May 8, 1973, No. 612 at AA–4.

II

On October 7, 1969, in Opinion 568, 42 FPC 738, affirmed *sub non. City of Chicago* v. *F.P.C.*, 458 F. 2d 731 (D.C. Cir. 1971), cert. denied 405 U. S. 1074 (1972), the Commission applied the area rate principle to pipeline company producers of natural gas. This policy placed pipeline producers on a parity with independent producers by pricing, in future pipeline rate proceedings, gas produced by pipelines or by their affiliates from leases acquired after October 7, 1969, at the just and reasonable rate applicable to gas of a vintage corresponding to the date of completion of the first well on the lease. Natural gas reserves owned by jurisdictional pipelines have declined in recent years when Commission policy was to price their gas on an individual company cost-of-service basis.

III

The Commission has moved to clarify the status of research and development expenses in an effort to stimulate technological developments in the natural gas industry. The Commission issued on August 26, 1970, in Docket No. R–381, new regulations which revise and clarify the Commission's accounting treatment of research and development expenditures. These changes allow the regulated companies to recover legitimate research costs. This rulemaking resulted from the analysis of responses to the Commission's Order No. 322 which required annual reporting of research and development expenditures. These responses showed minimal research and development activity in the natural gas industry at a time when major supply problems and environmental concerns affect the industry.

The Commission has taken action to provide utility companies with a more informed basis for planning ways to meet their ever increasing operating and financial needs by reducing regulatory uncertainty and providing consistency between accounting and rulemaking wherever possible and by clarifying the existing policies in these areas. For example, Commission Order No. 420 issued January 7, 1971 (36 F.R. 507) prescribes accounting treatment of land held for future use.

To encourage the greatest possible participation in research and development by electric and gas utilities, the Commission on December 13, 1972, asked for comments on revisions to its regulations. On April 30, 1973, the Commission issued Order No. 483 (Docket No. R–462) amending its regulations to allow gas pipeline companies to apply for advance FPC approval to include R&D expenses of $50,000 or more in a project as a rate base item. Companies may also apply for authority to track R&D expenditures which exceed amounts included in their rate base. The FPC also amended its accounting system to provide for costs associated with R&D plants operated in an experimental status. Rate treatment may be accorded for a company undertaking or its contribution to a joint project. Under the Order, the definition of R&D is broadened to coincide with todays need for increased energy supplies.

IV

The Commission set just and reasonable rates for production from Southern Louisiana, our most prolific gas producing area, by Opinions Nos. 546 and 546–A, issued on September 30, 1968, and March 20, 1969, respectively, in Docket No. AR61–2, et al. Concurrently with the later opinion, the Commission initiated in Docket No. AR69–1 a limited investigation into future sales of natural gas from Offshore Southern Louisiana. On December 15, 1969, the Commission enlarged that proceeding to include all gas regardless of contract date produced both onshore and offshore in the Southern Louisiana area and called for evidence with respect to the adequacy of gas supply and adequacy of service to consumers, the demand for gas, and the cause of a gas shortage, if any.

On March 19, 1970, the U.S. Court of Appeals for the Fifth Circuit sustained the orders of the Commission in Opinion Nos. 545–546–A but explicitly provided that this mandate should not be interpreted to interfere with Commission action that would change the rates approved. The Court expressed concern over strong evidence that a supply deficiency is imminent. *Southern Louisiana Area Rate Cases v. FPC*, 428 F. 2d 407 (5th Cir. 1970), cert. denied. *Municipal Distributors Group et al. v. FPC 400* U.S. *950*, 27 L .Ed. 2d 257, 91 S. Ct. 241 (1970). On petition for rehearing, the Fifth Circuit on June 16, 1970, affirmed its grant of authority to the Commission to reopen any part of its orders, including those affecting revenues from gas already delivered.

In light of theses actions by the Courts, on December 24, 1970, the Commission reopened the proceedings in Docket Nos. AR61–2, *et al.* and consolidated them with the proceedings in Docket No. AR69–1 so that the parties might be given an opportunity to submit, if they so desired, relevant evidence concerning whether the rates established in Opinion Nos. 546 and 546–A should be changed in the light of the Fifth Circuit's decision.

By Opinion Nos. 598 and 598–A issued July 16, 1972, and September 9, 1971, the Commission set new, higher ceiling rates for the Southern Louisiana area and provided a system of incentives to promote dedication of gas reserves to the interstate market. *Area Rate Proceedings*, (*Southern Louisiana Area*), Docket Nos. AR61–2, *et al.*, and AR69–1. The order denying rehearing was issued on September 9, 1971, and was appealed on the Fifth Circuit. *Placid Oil Co.* v. *F.P.C.*, No. 71–2761. The U.S. Court of Appeals for the Fifth Circuit on April 16, 1973, sustained in full the FPC's Order 598 and 598–A as a decision on the merits.

V

On January 23, 1970, the Commission gave notice in Docket No. R–380 of a proposed rulemaking to amend its Regulations to provide for accounting and rate treatment of advance payments made to suppliers by pipelines for gas to be delivered at a future date. The receipt of such advance payments by producers is intended to encourage acquisition, exploration, and development of gas producing properties.

Subsequent to receipt of comments, on October 2, 1970, in Order No. 410 the Commission amended its Uniform System of Accounts to permit unrecovered advance payments to be included by pipelines in their rate base as part of working capital. In the Commission's view, it was not at the time in the public interest for pipeline companies to bear the cost of assuring themselves and their customers of a future supply of natural gas.

On January 8, 1971, in response to applications for rehearing, the Commission issued Order No. 410–A and a notice of proposed rulemaking in Docket No. R–411 to permit further comments on proposed modification, but stressed that Order No. 410 treatment applied in the interim except as to advances made to affiliates for lease acquisition and exploration costs. Order Nos. 410 and 410–A have been affirmed. *Public Service Commission for the State of New York* v. *F.P.C.*, 467 F. 2d 361 (D.C. Cir. 1972). The Commission, by Order No. 441, issued November 10, 1971, in Docket No. R–411, provided that all advances made pursuant to contractual obligation entered into on or after November 10, 1971, until December 31, 1972, shall be subject to its provisions. This order differed from Order Nos. 410 and 410–A in that it (1) excluded from rate base treatment advances made for exploration and lease acquisition, (2) prohibited pipeline affiliated producers from acquiring a working or other economic interest as a result of an advance, (3) provided the advances included in rate base be repaid by the producer to the pipeline in full, by delivery of natural gas or other consideration, within five years, or as otherwise authorized by the Commission, from the date gas deliveries commence or the date it is determined that recovery will be in other than gas and (4) stated that pipeline affiliated producers shall be treated equally with independent producers.

VI

On December 29, 1972, the Commission issued Order No. R–465 which: (1) extended the advances made for exploration within the lower forty-eight states pursuant to contractual obligations entered into on or after December 29, 1972, until December 31, 1973, (2) excluded advances for lease acquisition from rate base treatment, (3) permitted pipeline affiliated producers to obtain a working or other economic interest as a result of an advance, (4) deleted the requirement for pipelines making an advance to recoup the advances from the producers if the pipeline absorbs the cost itself at no cost to its ratepayers, (5) provided for removal of the advance from rate base treatment at the end of 5 years if no gas deliveries have been made or no determination has been made that the advance will be non-recoverable. Also required that advances not be accorded rate base treatment if gas does not flow to the advancing pipeline and requires revenues collected to be refunded. The Commission noted that the extension of the advances program was warranted in that it has in the words of the U.S. Court of Appeals, "represented a justifiable experiment in the continuing search for solution to our nation's critical shortage of natural gas."

Simultaneously with the issuance of Order No. 465, the Commission issued a Notice of Proposed Rulemaking in Docket No. R–466, which would prescribe the proper ratemaking and accounting treatment for advances made outside the lower forty-eight states within the North American continent where such gas will be accessible by pipeline to the lower forty-eight states. Comments were solicited.

VII

On February 25, 1970, in Order No. 395, the Commission revised its regulations and rules under the Natural Gas Act to allow increased expenditures for budget-type gas purchase facilities. The purpose of the budget rule is to expedite numerous minor projects. The increase in allowable expenditures gives companies added flexibility and results in a decrease in the lag in deliverability and results the discovery of gas and its flow to interstate pipelines. On May 9, 1973, in Order No. 474, the Commission revised its regulations to permit budget-type applications for relocation and construction of gas purchase field compression facilities.

VIII

On June 17, 1970, the Commission in Docket No. R–389 instituted an investigation and proposed rulemaking to consider the terms and conditions under which it will issue permanent certificates for, and otherwise regulate, new sales of natural gas subject to the Commission's jurisdiction in the Permian Base area of southwestern Texas and southeastern New Mexico. On July 17, 1970, in Docket No. R–389–A, the Commission expanded the scope of its investigation and proposed rulemaking to cover certificates for new sales of natural gas subject to the Commission's jurisdiction nationwide (except Alaska and Hawaii). The Commission stated it would accept for consideration applications by independent producers requesting issuance of a certificate for sales of natural gas notwithstanding that the proposed rates may be in excess of the ceiling or guideline rates.

Numerous certificates have been issued by the Commission pursuant to this statement, representing sizeable volumes of natural gas available to interstate pipelines. In this connection, Order No. 435, issued July 15, 1971, (Docket No. R–398 and R–398–A) established initial rates in the Rocky Mountain Area. (Also see Item XXIII). On November 14, 1972, a report on the investigation of intrastate sales made under contracts dated on and after September 15, 1971, was submitted to the Secretary of the Commission supplementing reports issued in September 1970 and November 1971, relating to intrastate sales contracts dated on and after January 1, 1966. This data is essential to an understanding of the factors which effect regulation of the interstate market.

IX

On June 17, 1970, in Docket No. AR70–1 the Commission instituted a second area rate proceeding in the Permian Basin area to review the just and reasonable rates established by the Commission in 1965. Formal hearings were completed in January, 1972. The Administrative Law Judge issued an initial decision on December 20, 1972, which would raise ceiling rates for natural gas produced in the Permian Basin. This decision is subject to Commission review.

X

On October 27, 1970, by Order No. 413, the Commission terminated moratorium prohibitions against rate increase filings by natural gas producers in the Southern Louisiana area. It was proposed that such a termination would encourage increased exploration and development efforts for natural gas and the dedication of greater volumes of gas from that area to the interstate market.

XI

On October 16, 1969, the Commission instituted a Rulemaking in Docket No. R–371, for just and reasonable area rates for the Appalachian and Illinois Basins through rulemaking procedures rather than the lengthy area-rate hearings which had been conducted in the major producing area, thus hoping to assure rapid disposition of the matter and insure continued stability in the area. On October 2, 1970, the Commission, relying on written comments and reports and on an oral conference, rather than a full-blown evidentiary hearing, issued Order No. 411 establishing area rates for these Basins.

XII

In August of 1969 and July, 1970, the Commission urged the Secretary of the Interior to conduct a general oil and gas lease sale in the Gulf of Mexico. Public hearings were held on July 14, 1970, in New Orleans, at which the Chief of the Bureau of Natural Gas presented detailed testimony in further support of the sale. The oil and gas lease sale was held on December 15, 1970. Involved were 1,043 bids and bonuses to the Federal Government from 116 winners totaling a record $845.8 million. The Chief of the Bureau of Natural Gas also testified in favor of another lease sale at public hearings held in New Orleans on September 8, 1971. This sale, originally scheduled for December 1971, was postponed until September 12, 1972 after court action initiated by environmentalist groups. It resulted in high bids totalling $586 million. The President in his June 4, 1971, energy message to Congress proposed to make available the energy resources of Federal lands. In compliance with the President's proposal, the Department of Interior has published a tentative five-year schedule of twelve proposed lease sales. The Commission and its staff has consistently supported, including detailed testimony at formal hearings, all offshore lease sale proposals. The Chief, Bureau of Naturgal Gas, appeared once again on August 22, 1972, in New Orleans to testify in favor of another offshore lease sale which was held in December, 1972.

XIII

In order that the Commission may improve its capability in the measurement of supply and demand and thereby enhance its ability to effectively regulate and provide a continuing reliable supply of gas to meet consumer demands, the Congress approved the Commission recommendation to undertake a National Gas Survey by providing funds for the Agency's fiscal year 1971 budget. Some of the more important questions to be examined in depth by the Survey are (a) the precise dimensions of the gas supply problems, (b) the extent to which pipeline expansion of facilities is threatened by inflation and uncertainty of new gas supplies, (c) the role of natural gas in air pollution control, (d) the supply-price-demand relationship, (e) the potential impact of interfuel competition, (f) import-export policies, (g) the role of synthetic fuels in the long-term supply of gas, and (h) the regulatory role in relation of these issues.

XIV

On November 4, 1970, the Commission undertook a nationwide investigation to enable it to establish policies and regulations for developing plans to help assure the reliability of electric power and natural gas service—Policy Statement Notice of Investigation and Proposed Rulemaking with Respect to Developing Emergency Plans—Reliability of Electric and Gas Service, Docket No. R–405.

Although the proceeding was initiated for the purpose of fulfilling the responsibilities of the Commission for reliability of gas and electric service under the Federal Power Act and the Natural Gas Act, the resulting plans and procedures will serve to aid in carrying out the overall Federal program to assure an adequate energy supply.

The investigation was separated into two phases: Phase I concentrated on the period from November 4, 1970, (the date of the notice), through March 31, 1971. The objective of this phase was "to elicit information from those anticipating emergency situations during this phase period." Only those with such an emergency situation were required to respond and were requested to do so by December 1, 1970. Phase II concentrated on the period from the date of the notice through 1975, and all gas transmission and distribution companies were asked to respond by January 7, 1971, with projections through 1975, of relevant information including but not limited to—

(a) Adequacy of supplies and delivery capacity.
(b) Adequacy of plans to meet emergency conditions.

The Commission received about 300 replies from interstate and intrastate pipeline companies, privately and publicly owned distribution companies, interested state regulatory agencies, trade associations and the Environmental Protection Agency.

The Commission obtained data from the producers of natural gas to determine what volumes of proved natural gas reserves, if any, were held by producers in any area that were not contracted to pipelines or direct customers.

XV

The Commission was advised that natural gas distributing companies, which are exempt from the provisions of the Natural Gas Act under Section 1(c) thereof, have received an increasing number of requests from distributors located in other States and interstate pipeline companies for short-term supplies of gas to meet temporary emergencies caused by weather conditions, acts of God, breakdown or facilities or other unforeseen situations or to replenish depleted storage reservoirs in order to meet consumer needs in a forthcoming heating season. In order to facilitate responses to such requests, the Commission indicated by Statements of Policy issued May 6 and June 3, 1970, Order Nos. 402 and 402–A that the recipients of such requests would not jeopardize their exempt status under the Act by making short-term sales or deliveries of natural gas in interstate commerce to the extent that such transactions enable those companies confronted with emergencies to meet their system requirements, subject to reporting provisions and prior Commission approval in emergencies exceeding 60 days. By Order No. 418 issued December 10, 1970, in Docket No. R–404, the Commission amended its Regulations under the Natural Gas Act to permit independent producers to sell natural gas to pipelines for emergency purchases for periods up to 60 days without first obtaining certificate authorization from the Commission.

XVI

The Commission on September 18, 1970, in Opinion No. 586 adopted a settlement proposal submitted by a majority of the parties to the Hugoton-Anadarko Area Rate Proceeding, Docket No. AR64–1, *et al.*, thus establishing just and reasonable rates for the area. The Commission found that the proposed settlement was fair to the consuming public and would promote certainty and stability and contribute to obtaining additional supplies of gas from this crucial area. This opinion on appeal to the Ninth Circuit, No. 71–1036, was upheld by the Court of Appeals on July 31, 1972.

XVII

The Commission on February 18, 1971, issued Order No. 423 in Docket No. R–407 establishing as a matter of general policy a suspension period of one day from the proposed effective date of a rate change filing made by an independent producer unless the Commission imposes a longer suspension period. The former five-month suspension period which had generally been applied to producers placed them at a disadvantage because they also were limited by contract as to when an increase might be made effective. A five-month suspension period also deprives a producer of revenues to which it would otherwise be entitled in the event the proposed rate is found to be just and reasonable. Order No. 423 was remanded by the court in *Public Service Commission for the State of New York* v. *F.P.C.*, 463 F. 2d 883 (D.C. Cir. 1972).

XVIII

On March 18, 1971, in Order No. 428 issued in Docket No. 393, the Commission amended its regulations covering natural gas sales by small producers, which are defined as independent producers with annual total nationwide jurisdictional sales not in excess of 10,000,000 Mcf. Although only accounting for about 15% of the total volumes of interstate gas sales, small producers comprised all except about 70 of the over 4,700 natural gas producers in the United States. Their exploratory efforts are extremely valuable to the discovery of new sources of gas.

Under the new provisions, small producers may apply for a blanket certificate to cover all existing and future jurisdictional sales. Those receiving such certificates are authorized to make small producer sales pursuant to existing and future contracts at the price specified in each such contract. Thereafter, so long as the holder of the certificate qualifies as a small producer and complies with its terms, the only filings required by the Commission are an annual statement of total jurisdictional sales and applications for abandonment of facilities or service. The Commission's purpose in thus classifying small producers was to facilitate their entry into the interstate market and to stimulate competition among producers to sell in interstate commerce as well as to encourage their exploratory efforts. Assurance is given small producers that the provisions of their contracts for the interstate sale of gas will not be subject to change. A further purpose is to relieve the small producer of the expenses and burdens relating to regulatory matters.

The Commission's action was not to deregulate sales by small producers, but to exempt small producers from area price ceilings. Such sales will be regulated in pipeline rate and pipeline certificate proceedings by Commission review of the purchased gas costs of each pipeline with respect to small producer sales. The Commission's order provided protection for the consumer by safegarding against unreasonably high small producer prices.

On December 12, 1972, the U.S. Court of Appeals for the District of Columbia in *Tennessee Gas Pipeline Company* v. *F.P.C.*, D.C. Cir. No. 71–1722 *et al.*, set aside the Commission's Order No. 428 (including amendments thereto in Orders Nos. 428–A and 428–B) concluding that the FPC exceeded its authority under the Natural Gas Act. In its opinion precluding exemption of small producers from direct rate regulation and filing requirements, the Court indicated that it did not take exception to the Commission's motives or the benefits that might flow to consumers of natural gas through some form of deregulation of small producers. It stated: "the Power Commission has made a conscientious and intelligent effort to cope with an enormous national problem. Where the Commission has failed is not in its diligence and its expertise. It has simply failed because the methods adopted do not square with its duties under the Natural Gas Act."

The Commission issued an order on March 30, 1973, authorizing temporary certificates to small producers to collect their contract rates subject to refund, pending judicial review of its Order 428. A petition for certiorari has been filed with the Supreme Court.

XIX

The Commission has authorized increase imports of gas by pipeline from Canada. The net import of natural gas from Canada in 1972 was 993.5 million Mcf, which was an annual percentage increase of about 18 percent over the 1971 figure. During 1972, net Canadian imports accounted for approximately 4 percent of U.S. consumption.

XX

As of November 1, 1972, the Commission authorized the importation of the equivalent of 9,865 MMcf of liquefied natural gas (LNG) on a short-term basis from Canada, Algeria and Libya. On March 9, 1972, the Commission issued Opinion No. 613 granting the import authorization in Docket No. CP70–196 by Distrigas Corporation for 15.4 million Btu of LNG annually. Other proceedings are pending.

XXI

On April 15, 1971, in Order No. 431, the Commission promulgated as a new Section of its General Policy and Interpretations, Section 2.70, entitled "Measures for the Protection of Reliable and Adequate Natural Gas Service." The Statement of general policy provides that jurisdictional pipeline companies shall take all steps necessary for the protection of as reliable and adequate service as present supplies and capacities will permit during the 71–72 heating season and thereafter. In order to effectuate this, the Commission:

(a) Encouraged companies to fill all storage fields;

(b) Required the filing of curtailment plans as an amendment to existing tariffs by jurisdictional companies which intended to curtail service;

(c) Indicated that additional short-term gas purchases may still be necessary to meet the demands and indicated the procedure under which this could be done;

(d) Stated that where emergency gas purchases are made and/ or curtailment program is instituted, volumetric limitations should be set on sales at current levels;

(e) Indicated that the Commission will reexamine existing commodity rate levels and may redesign existing commodity demand rate relationships;

(f) Encouraged pipelines to enter into exchange arrangements with other pipelines.

XXII

The Commission on May 6, 1971, in Opinion No. 595 set just and reasonable rates for sales of gas in interstate commerce from the Texas Gulf Coast, Docket Nos. AR62–4, *et al.* The Commission set a ceiling of 24 cents fer Mcf for gas sales made under contracts dated on or after October 1, 1968, whether within the tax jurisdiction of the State of Texas or the offshore Federal domain. Rates for gas sold in interstate commerce under contracts dated prior to October 1, 1968, were established at varying levels with a just and reasonable rate of 19 cents effective as of October 1, 1968, for all such contracts. In addition the Commission offered incentives to producers to stimulate exploration and production by permitting credits to refund obligations through dedication of new supplies, and increased rates if new dedications reached the levels set forth in the opinion. The Texas Gulf Coast is the nation's second largest producing area. This case is on appeal to the District of Columbia Circuit. *Public Service Commission for the State of New York* v. *F.P.C.*, No. 71–1828.

XXIII

On July 15, 1971, the Commission by Order No. 435 in Docket Nos. R–389 and R–389–A, established initial rates at which sales of natural gas in the Rocky Mountain Area are to be certificated, without refund obligation, for sales made under contracts dated after June 17, 1970. The rates which the Commission established represent the area rate levels for the areas involved until such time as just and reasonable rates are promulgated for the area. This case is on appeal to the District of Columbia Circuit. *American Public Gas Assn.* v. *F.P.C.*, No. 71–1812.

Concurrently, the Commission, in Docket No. R–425, gave notice instituting a rulemaking proceeding to issue rules fixing the just and reasonable rates and otherwise regulating jurisdictional sales of gas made under contracts dated before October 1, 1968 and to determine whether the initial rates established by Order No. 435 shall apply to contracts dated on or after October 1, 1968 for the Rocky Mountain Area.

The Notice of Rulemaking was appealed to the Court of Appeals for the Tenth Circuit (Phillips Petroleum Company, *et al.* v. F.P.C. Nos. 71–1659, *et al.*). On February 20, 1973 the Court affirmed the right of the Commission to determine just and reasonable rates by informal rulemaking procedures. Setting of rates by rulemaking has reduced regulatory lag.

On April 11, 1973, the Commission issued its Opinion No. 658 (Docket No. R–425) establishing a ceiling rate of 24.0¢ per Mcf, subject to Btu adjustment, for gas produced in the Rocky Mountain Area and sold under contracts dated prior to October 1, 1968 and wells dedicated to these contracts commenced on or before December 31, 1972. This rate is exclusive of state production or severance charges. A minimum area rate of 15.0¢ per Mcf, subject to Btu adjustment, but inclusive of additive charges and adjustments and state production taxes was also established.

XXIV

On October 29, 1971, in Docket No. AR67–1, *et al.*, the Commission issued its Opinion No. 607 setting just and reasonable rates for natural gas produced in the "Other Southwest Area." This area covers all of Mississippi and Arkansas; four counties in Northwest Alabama; northern Louisiana; Railroad Commission districts Nos. 5, 6, and 9, in northeast Texas; and 56 counties in eastern and southeastern Oklahoma. The opinion establishes prices by dates under three general contract periods which include variations by date and sub-areas within these periods. The ceiling prices for contracts dated on and after October 1, 1968, range from 23.0 cents per thousand cubic feet to 26 cents for pipeline quality gas. Lower prices are provided for contracts dated prior to this time. The opinion includes provisions for escalation of area ceilings, provides for refunds in excess of applicable area rates and places a moratorium on price increases until July 1, 1976. No minimum rates are provided. The higher prices provided incentives to the producers in this area to find gas and dedicate it to interstate commerce.

XXV

On November 5, 1971, Docket No. R–403, the Commission issued Order No. 440, adopting full-cost accounting for exploration and development costs on leases acquired after October 7, 1969.

XXVI

On January 17, 1972, the Commission issued Opinion No. 607–A, which permits producers to discharge their refund obligations by dedications of additional gas reserves from the Other Southwest area to interstate commerce. This policy is consistent with previous Commission decisions regarding Southern Louisiana (Opinion Nos. 598 and 598–A) and Texas Gulf Coast (Opinion Nos. 595 and 595–A). This case is on appeal to the Fifth Circuit. *Shell Oil Co.* v. *F.P.C.*, No. 72–1114.

XXVII

On August 3, 1972, after receiving comments from interested parties the FPC issued Order No. 455, (Docket No. R–4441) authorizing a new optional procedure for certification of new gas sales as an alternative to existing procedures. The Commission's action was designed to alleviate the gas shortage through dedication of new reserves from domestic production to assure reliable and adequate natural gas to the consumer at the lowest reasonable cost. Under the new procedure, consumers will not pay higher rates for gas except for new supplies, and then only to the extent that it is established that the price is required by the public interest.

The optional procedure does not supersede the area rate procedures under which parties may continue to operate but provides that producers may apply for a certificate for sales in excess of the area ceiling rate for gas which was not available to the interstate market prior to April 6, 1972—the date of the original rulemaking notice. It applies to all the producing areas of the nation, and rates under the optional rules will be firm, not subject to refund. The optional procedure is available only under certain specified conditions and applications filed under this new procedure will be processed within established requirements, including: notice, intervention, and hearing. This proceeding is on appeal to the District of Columbia Circuit in *John E. Moss, et al.*, v. *Federal Power Commission*, No. 72–1837.

XXVIII

On June 7, 1972, in *Federal Power Commission* v. *Louisiana Power & Light Co., et al.*, 4 6 U.S. 621, (1972), the Supreme Court upheld the Commission in its assertion of jurisdiction in effectuating a curtailment plan which includes deliveries not only to purchasers for resale but also to direct sales customers of a jurisdictional pipeline. The Court held that under Section 1(b) of the Natural Gas Act the Commission has the power to regulate the curtailment of direct sales of natural gas along with the sales for resale. The Commission, thereby, has been given wide latitude to insure the reasonableness and fairness of curtailments of service initiated by interstate pipeline companies that, due to the serious gas suply problem, are forced to deliver to their customers less than the contracted-for quantities of gas.

XXIX

On June 28, 1972, in Opinion No. 622, the Commission authorized the importation of the equivalent of approximately 1,000,000 Mcf per day of liquefied natural gas (LNG) from Algeria for a period of 25 years as requested by Columbia LNG Corporation, *et al.*, (Docket No. CP71–68, *et al.*) The primary purpose of the Commission's acting was to alleviate the existing gas shortage in the United States. Columbia LNG and Consolidated LNG were authorized to import LNG at 77 cents per MMBtu and the third importer, Southern Energy, was permitted to import its respective volumes at 83 cents per MMBtu. The importers are subsidiaries of individual pipeline systems which supply gas to markets in New York, Pennsylvania, Ohio, West Virginia, Maryland, Virginia, Kentucky, the District of Columbia, Alabama, Georgia, Louisiana, Mississippi, South Carolina, Tennessee, New Jersey, and Florida. In addition, the Commission imposed incremental costing concepts whereby the risks and costs for the projects are borne by the companies, their stockholders, and the consumers who contract to purchase LNG, and not by those ultimate consumers who would not derive a benefit from such importation.

On October 5, 1972, after granting rehearing in part of its Opinion No. 622, the Commission issued Opinion No. 622–A which affirmed, with modifications, its prior authorization of LNG imported from Algeria. The major modifications include: (a) affirmed incremental pricing of regasified LNG by pipeline purchasers but eliminated the requirement for pipeline customers to sell the LNG under separate rate schedules; (b) determined El Paso Algeria was not a natural gas company; (c) affirmed price ceilings of 77¢ and 83¢ but clarified that the importing companies may request modifications if actual costs exceed these estimates; and (d) alowed minimum bill provisions to permit recovery of certain fixed expenses in event of non-delivery. Environmental issues involving the routing of a portion of the pipeline will be subject to future hearings. Petitions for review of the Commission Opinions have been filed in the District of Columbia, Third and Fifth Circuits. On March 30, 1973, the Commission granted petitions to amend the certificates so as to substitute a tunnel for a trestle at the Cove Point Maryland project.

XXX

On July 31, 1972, in Docket No. R–418 the Commission issued Order No. 431–A which extended for an indefinite period the provisions initiated in Order 431 (Item XXII) for limited term certificates with pre-granted abandonment to sellers. To be eligible gas pipeline companies must demonstrate an emergency need for gas on their system, and take all steps necessary for the protection of as reliable and adequate service as present supplies and capacities will permit including adequate injection into storage and filing of a curtailment plan if curtailment will be necessary. Pipelines are barred from initiating interruptible sales during the term of the certificate authorization.

XXXI

On April 12, 1973, after notice of proposed rulemaking on November 8, 1972, the Commission issued Order No. 481 (Docket No. R–458). The Order provides that it will be the general policy to consider applications by independent producers for special relief where reduced pressures, need for reconditioning wells, deeper drilling, or other factors make further production uneconomic at existing rates. Relief, where granted, will be in the form of a contractually authorized rate increase, or rate increases where the contract rate has expired, in excess of the area ceiling rate. This policy also applies to pipeline production from leases acquired after October 7, 1969. Applicants must establish the economic justification for sales that would otherwise be abandoned. This order should promote the recovery of gas reserves for the interstate market that might otherwise be lost.

XXXII

After notice of rulemaking on November 9, 1972, the Federal Power Commission issued Order No. 482 on April 12, 1973 (Docket No. R–459) to provide special pricing relief to producers to encourage the recovery and sale in interstate commerce of gas which is or would otherwise be flared or vented. Under the order, producers may apply for special relief from area rates or seek to sell gas under existing provisions of the Commission's Rules for: limited-term certificates and pre-granted abandonment; optional pricing procedure; or exemption of emergency sales or transportation of gas. If pipeline purchasers install facilities to recover gas that would otherwise be flared, they can build the facilities under their budget authorization, and may file for accounting treatment of facilities depreciation. Purchasers of the gas under the Order will be permitted to file for higher rates to maintain the same differential between purchase and resale price of other gas sold at the processing plant or in the same general area.

XXXIII

On December 7, 1972, the Commission issued Option No. 637 (Docket Nos. CP72–35, *et al.*) on an application by Algonquin SNG, Inc. *et al.* to construct a synthetic gas plant and related facilities near Fall River, Massachusetts. Naphtha feed stock would be converted into synthetic gas (SNG) and sold to Algonquin Gas Transmission Co. for transmission and resale in the northeastern states.

The Commission ruled that it did not have jurisdiction over the application to construct and operate facilities to manufacture synthetic gas from naphtha as naphtha is not "natural gas". The sale of synthetic gas to an interstate pipeline was also found to be nonjurisdictional. However, the interstate transportation and sale for resale after it has been mixed with natural gas in the interstate pipeline's system was clearly within the FPC jurisdiction and a certificate of public convenience and necessity was found necessary.

The FPC approved Algonquin Gas Transmission's proposed facilities and services as serving the public convenience and necessity. It approved the initial wholesale rates for the SNG service at $1.80 per Mcf as just and reasonable for the first year but conditioned the authorization to provide that the SNG must be sold at special service rate to recover all costs and fixing $1.80 per Mcf as a maximum price for sales when the project is first placed in service. The anticipated plant output would provide a maximum of 120 million cubic feet daily for sale.

XXXIV

On December 12, 1972, the Commission issued its Opinion No. 639 (Docket No. R–371) denying petitions to amend regulations governing sales in interstate commerce of natural gas produced in the Appalachian and Illinois Basin Areas established by Order No. 411 (Item XI). Order No. 411, set just and reasonable rates for "old" and "new" gas, and imposed a moratorium on rate increases.

In refusing to set new ceiling rates, the FPC indicated that setting rates area by area has not proven a flexible means to maintain a workable relationship between supply and demand. A new area rate might lead to a new round of area rate proceedings which the Commission believed would not alleviate the gas shortage. Further, the Commission stated it choose not to establish a new rate for "new" gas as determined by contract date vintaging as adherence to the vintaging concept is not necessary for the protection of an adequate and reliable gas supply for the consumer.

The Commission said that the optional procedures permitted by its Order No. 455 (Item XXVII) are well suited to the pricing problems of gas in Appalachian-Illinois.

The wording of Order 411, and all other Commission area rate orders or opinions of similar import, stating that "old" gas will be applicable to "gas sold pursuant to a contract dated prior to October 8, 1969" will be literally and strictly applied, the Commission said. If a contract dated prior to that date terminates, and the buyer and seller enter into a new contract, the sales will be governed by the applicable pricing provisions relating to "gas sold pursuant to a contract dated after October 7, 1969". This will eventually result in elimination of a two-price system.

XXXV

On January 8, 1973, the Commission announced several new actions to cope with the current nationwide shortage of natural gas. The first step was issuance of a proposed policy statement in a rulemaking proceeding (Docket No. R–467) to establish priorities in the use of natural gas. The Commission proposed priorities-of-service to be followed by jurisdictional pipeline companies in requesting approval for service to new and/or additional direct and resale customers during the shortage period. To arrive at a rational energy resource program with effective and timely procedures, the Commission requested that interested parties submit their comments and suggestions.

In addition to evaluating the proposed specific priorities-of-service and their impact on economic, environmental and conservation of energy considerations, the Commission indicated it was soliciting comments on alternatives which may be considered in allocation of limited gas reserves during a shortage period. Alternatives include: (1) changes on rate design techniques, (2) revision of take-or-pay provisions to conserve gas for superior end-use customers, (3) incentives to encourage additional storage facilities, (4) consideration of end-use in reviewing import and certificate requests and tariff changes, (5) market studies by pipelines to reflect end-usage of present sales as a basis for removing low priority usages.

In its second action, the Commission adopted in its Order Nos. 467 and 467A (Docket No. R–469) a policy statement establishing priorities for natural gas deliveries by jurisdictional pipeline companies during periods of curtailments. Further, pipelines were directed to include procedures in their tariffs to meet emergency situations, including environmental emergencies that might occur during periods of curtailment.

In determining the priority-of-service limitations, the Commission indicated it was aware of the economic impacts but that there was no choice to imposing restrictions within its jurisdiction during the gas supply shortage. Further. it called for cooperation of state authorities in implementing the program. The basic objective of the priorities is the protection of deliveries for residential and small volume consumers who can not be safely curtailed on a daily basis.

Eight initial priorities of service categories were established for deliveries during periods of curtailment, except when extraordinary circumstances exist (the same priorities are proposed for service to new and/or additional customers during a shortage period under the proposed policy statement in Docket No. R–467).

In its third step, the Commission in its Notice of Proposed Rulemaking and Request for Comments (Docket No. 9–468) proposed revisions to its Regulations to reflect the changes in its policy statement in Order No. 467 and 467A, and its proposed statements of policy issued in its concurrent notice in Docket No. R–467. The proposed revisions are designed to obtain additional information to administer the Natural Gas Act with respect to the policies regarding end-use priorities. In its proposed revision, the Commission solicited comments on its proposal that certain existing and future large volume industrial sales be made only on an interruptible basis.

On March 2, 1973, the Commission issued Order No. 467B (Docket No. R–469) modifying its policy statement in Order Nos. 467 and 467A. The revised policy statement provides that interstate pipeline companies will use the following priorities for curtailment:

(1) Residential, small commercial (less than 50,000 cubic feet on a peak day).

(2) Large commercial requirements (50,000 cubic feet or more on a peak day) and firm industrial requirements for plant protection, feedstock and process needs, and pipeline customer storage injection requirements.

(3) All industrial requirements not specified in the priority listing.

(4) Firm industrial requirements for boiler fuel use at less than 3,000,000 cubic feet per day, but not more than 1,500,000 cubic feet per day, where alternate fuel capabilities can meet such requirements.

(5) Firm industrial requirements for large volume (3,000,000 cubic feet or more per day) boiler fuel use, where alternate fuel capabilities can meet such requirements.

(6) Interruptible requirements of more than 300,000 cubic feet per day, but less than 1,500,000 cubic feet per day, where alternate fuel capabilities can meet such requirements.

(7) Interruptible requirements of intermediate volumes (from 1,500,000 cubic feet per day through 3,000,000 cubic feet per day), where alternate fuel capabilities can meet such requirements.

(8) Interruptible requirements of more than 3,000,000 cubic feet per day, but less than 10,000,000 cubic feet per day, where alternate fuel capabilities can meet such requirements.

(9) Interruptible requirements of more than 10,000,000 cubic feet per day, where alternate fuel capabilities can meet such requirements.

Lower priority categories (those with highest numbers) are to be fully curtailed before any higher priority volumes. Direct and indirect pipeline customers that use gas for similar purposes are to be placed in the same category.

Curtailment plans filed with the Commission shall provide sufficient flexibility to allow pipelines to respond to emergency situations. Exceptions to the priorities may be permitted under extraordinary circumstances.

The policy statement including amendments is intended only to state initial guidelines, to provide pipeline curtailment planning and adjudication of curtailment cases.

XXXVI

On March 30, 1973, the FPC reaffirmed its Opinions (Nos. 622 and 622A) issued last June and October authorizing importation of LNG from Algeria and construction of facilities for receipt and regasification of LNG at Cove Point, Maryland, and subsequent transportation and sale of the resulting natural gas in interstate commerce.

The Commission's original opinions authorized Columbia LNG Corporation to import 300 million cubic feet daily, and Consolidated Systems LNG Company to import 350 million cubic feet daily to the Cove Point terminal. Southern Energy Company would import 350 million cubic feet daily at Elba Island near Savannah, Georgia. The prior authorization for this large volumes import was issued after extensive review of the project including the economic and environmental implications.

The Commission's action in reaffirming its authorization for the project pertains to the Cove Point facilities. Here the Commission approved the use of a tunnel instead of a trestle to connect tanker docking facilities in the Chesapeake

Bay with landbased facilities for storage and processing the LNG. In authorizing the modification to the project, the Commission found that changes did not constitute a major Federal action significantly affecting the quality of the human environment.

The FPC conditioned the granting of the certificate of public convenience and necessity on applicants obtaining all necessary Federal, State, and local authorizations including such items as: building permits, Coast Guard clearance, advising the FPC of changes in design and construction techniques, submitting certificates of compliance with safety standards, etc.

The approval by the Commission involves a major project for augmentation of waning domestic natural gas supplies.

XXXVII

In a notice of proposed rulemaking in Docket No. R–389B, issued on April 11, 1973, the Commission proposed to set just and reasonable rates and otherwise regulate jurisdictional sales by producers of natural gas for all producing areas on a nationwide basis. The single rate to be determined by final order in this docket will apply to all jurisdictional sales of gas produced from wells commenced on or after January 1, 1973, except emergency sales certificated under Order No. 431 or sales certificated under the optional certification procedure established by Order No. 455.

The proposed single rate would be applicable to both onshore and offshore production, whether gas-well gas or cashinghead gas. The single rate would be exclusive of state production taxes, but would be subject to upward and downward Btu adjustments.

XXXVIII

On May 23, 1973, the FPC proposed a single uniform rate for all producing areas on a nationwide basis (excluding Alaska and Hawaii). The just and reasonable rate to be determined in a rulemaking proceeding (Docket No. R–478) shall apply to all jurisdictional sales of natural gas which is produced from wells commenced before January 1, 1973, irrespective of contract date or date of deliveries.

There will be a uniform rate for both onshore and offshore production, whether gas-well gas or casinghead gas. This rate shall be exclusive of state production taxes, subject to adjustments for Btu content and delivery point.

In announcing this Action, the Commission seeks to establish rate stability, rate simplification, and provide the incentives necessary to encourage continued production from existing fields.

TABLE 1.—U.S. UNCOMMITTED RESERVES—PERCENT BY AREAS BY LARGEST PRODUCERS[1]

[In million cubic feet at 14.73 lb/in.²a]

Area	December 31, 1971						June 30, 1972					
	4 largest		8 largest		20 largest		4 largest		8 largest		20 largest	
	Total gas	Percent	Total gas	Percent	Total gas	Percent	Total gas	Percent	Total gas	Percent	Total gas	Percent
South Louisiana:												
Onshore	554,336	96.9	570,025	99.6	[2] 527,157	100.0	368,284	92.3	392,577	98.4	[2] 398,830	100.0
Offshore, Federal	661,039	57.0	966,107	83.3	1,157,005	99.8	715,012	49.6	1,080,819	74.9	1,440,192	99.9
Offshore, State	32,853	84.5	38,893	100.0	[2] 38,893	100.0	30,142	94.9	[3] 31,752	100.0	[2] 31,752	100.0
Texas Gulf Coast:												
Onshore	278,398	89.4	301,013	96.7	[2] 311,266	100.0	291,241	84.4	318,858	92.4	[2] 344,917	100.0
Offshore, Federal	301,003	98.5	[3] 305,574	100.0	[2] 305,574	100.0	[4] 152,624	100.0	[3] 152,624	100.0	[2] 152,624	100.0
Offshore, State	[4] 15,000	100.0	[3] 15,000	100.0	[2] 15,000	100.0	[4] 46,900	100.0	[3] 46,900	100.0	[2] 46,900	100.0
Permian Basin	282,925	63.6	384,710	86.4	445,046	100.0	256,970	80.6	300,547	94.2	[2] 318,976	100.0
Hugoton-Anadarko	32,669	76.6	40,289	94.5	[2] 42,624	100.0	34,367	62.6	45,729	83.3	[2] 54,866	100.0
Other southwest	514,671	93.3	543,875	98.6	[2] 551,694	100.0	161,500	94.4	169,943	99.3	[2] 171,061	100.0
Rocky Mountain	152,760	63.4	199,739	82.9	239,206	99.2	186,319	70.4	227,686	86.0	263,077	99.3
Appalachian	10,711	99.6	[3] 10,752	100.0	[2] 10,752	100.0	11,608	100.0	[3] 11,608	100.0	[2] 11,608	100.0
Unclassified:												
Michigan	[4] 3,484	100.0	[3] 3,484	100.0	[2] 3,484	100.0	0	----------	0	----------	0	----------
California	56,229	95.4	[2] 58,911	100.0	[2] 58,911	100.0	75,066	94.3	[3] 79,568	100.0	[2] 79,568	100.0
Miscellaneous	54,257	87.7	61,808	99.9	[2] 61,853	100.0	0,824	98.0	82,470	100.0	[2] 82,470	100.0
Lower 48	1,982,757	51.9	2,727,701	71.5	3,512,751	92.0	1,645,575	48.4	2,296,178	67.5	3,154,368	92.7
Alaska	1,710,955	93.9	1,821,722	99.9	[2] 1,822,861	100.0	1,705,455	93.9	1,816,193	99.9	[2] 1,817,181	100.0
Total, United States	2,897,635	51.4	4,284,065	75.9	5,300,064	94.0	2,661,923	51.0	3,854,799	73.9	4,947,831	94.8

[1] Does not include 26,000,000 in North Slope reserves reported in the aggregate for all companies by one producer.

[2] Less than 20 firms.

[3] Less than 8 firms.

[4] Less than 4 firms.

TABLE 2A

SALES BY PRODUCERS OF NATURAL GAS TO INTERSTATE AND INTRASTATE PIPELINE COMPANIES IN 1971

	Million cubic feet	Percent	
		Inter-state sales	Total market sales
Producer sales to interstate market:			
First 10 producers by rank:[1]			
Humble Oil & Refinery Co	1,348,397	9.2	
Shell Oil Co	783,669	5.4	
Amoco Production Co	780,437	5.3	
Gulf Oil Corp	751,012	5.1	
Phillips Petroleum Co	724,194	5.0	
Mobil Oil Corp	683,618	4.7	
Texaco Inc	609,816	4.2	
Union Oil Co. of Calif	549,932	3.8	
Atlantic Richfield	500,104	3.4	
Continental Oil Co	466,236	3.2	
Ten producers Total[1]	7,197,415	49.3	
291 producers Total[1]	6,576,517	45.1	
301 producers Total[1]	13,773,932	94.4	
Other 3,449 producers Total	823,895	5.6	
Total interstate sales producers 3,750[2]	14,597,827	100.0	64.9
Sales to intrastate market,[3] total	7,895,185		35.1
Sales to total market[4] total (less than 4,000 producers)	22,493,012		100.0

TABLE 2B

PURCHASERS OF NATURAL GAS BY INTERSTATE AND INTRASTATE PIPELINE COMPANIES FROM PRODUCERS, 1971

	Million cubic feet	Percent of interstate purchases	Percent of total inter- and intrastate purchases
Interstate pipeline company purchases:			
1st 10 companies by rank:			
El Paso Natural Gas Co	1,635,385	11.2	
Tennessee Gas, Pipeline Division, Tenneco	1,317,987	9.0	
United Gas Pipeline Co	1,311,390	8.9	
Transcontinental Gas Pipeline Corp	968,467	6.6	
Northern Natural Gas Co	914,297	6.3	
Natural Gas Pipeline Co. of America	898,115	6.2	
Columbia Gas Transmission Corp	786,271	5.4	
Michigan Wisconsin Pipeline Co	657,858	4.5	
Texas Eastern Transmission Corp	639,207	4.4	
Texas Gas Transmission Corp	562,788	3.9	
10 companies, total	9,691,765	66.4	
67 companies, total	4,906,062	33.6	
Total interstate purchases, 77 companies, total	14,597,827	100.0	64.9
Sales to intrastate market,[3] total	7,895,185		35.1
Sales to total market,[4] total	22,493,012		100.0

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[1] Producers whose combined sales were 2,000,000 M cf or more sales volume, high and low, and accounting for 70 percent of all natural gas produced and marketed in the United States.

[2] Includes all producers reporting sales to interstate markets.

[3] Estimate derived as differential between reported interstates sales and total marketed production as reported by the Bureau of Mines.

[4] Marketed production, including inter- and intra-state sales as reported by the Bureau of Mines. Includes an undetermined number of producers selling to the intrastate market who do not report sales to the Federal Power Commission.

Sources: Sales by Producers of Natural Gas by Interstate Pipeline Companies, 1971, FPC. Bureau of Mines Mineral Yearbook, 1971, Natural Gas, U.S. Department of the Interior.

TABLE 3A.—CONCENTRATION RATIOS IN 3 MAJOR GAS PRODUCING REGIONS, 1964–69[1]

Region and year of sales contracts	Percentage of annual volumes under new sales contracts		
	Largest firm	Largest 4 firms	Largest 8 firms
Southern Louisiana:			
1964	17.3	40.2	53.1
1965	20.6	48.1	62.3
1966	42.9	66.1	74.1
1967	19.9	44.7	59.7
1968	10.7	35.1	51.3
1969	11.1	38.4	63.7
Permian Basin:			
1964	21.4	58.7	77.8
1965	70.3	76.0	80.5
1966	22.3	57.8	71.2
1967	43.6	52.5	58.1
1968	14.9	36.7	56.8
1969	21.1	57.8	71.5
Texas Gulf Coast:			
1964	35.6	45.3	48.1
1965	86.6	92.0	95.9
1966	34.4	66.7	83.7
1967	21.3	46.3	54.5
1968	(2)	(2)	(2)
1969	21.9	62.6	71.5

[1] Compiled from FPC form 2. Percentages are based on each producer's sales volumes under non et al. contracts with interstate pipelines in 1st year following the year of contract. To the extent that these producers were parties to et al. contracts the concentration ratios are understated. The volumes exclude intrastate sales to interstate pipelines. The years shown refer to date of new sales contracts. (The ratios for 1965–69 are reproduced in hearings before the Joint Economic Committee, "Natural Gas Regulation and the Trans-Alaska Pipeline," June 8, 1972, p. 150.)

[2] Not shown because non et al. contracts accounted for only 13 percent of sales volumes under new contracts in that year. In all other years and in all areas shown, non et al. contracts covered more than 80 percent of sales volumes, except in 3 instances where the coverage ranged from 55 to 70 percent.

Source: Office of Economics, Federal Power Commission.

TABLE 3B.—CONCENTRATION RATIOS FOR 3-YEAR PERIODS, SOUTHERN LOUISIANA, 1964–69[1]

	Percent of annual volumes		
	Largest firm	Largest 4 firms	Largest 8 firms
Year of new sales contracts:			
1964 to 1966	29.5	49.5	59.3
1965 to 1967	20.1	44.5	56.0
1966 to 1968	14.1	31.0	43.0
1967 to 1969	8.3	29.4	45.2

[1] FPC form 2. Percentages are based on each producer's sales volumes under non et al. contracts with interstate pipelines in the 1st year following the year of contract. Intrastate sales to interstate pipelines are excluded.

Source: Office of Economics, Federal Power Commission.

TABLE 4

YEAREND 1970 AND 1971 DOMESTIC GAS RESERVES OF MAJOR PIPELINE COMPANIES DEDICATED TO INTERSTATE SALES

Yearend reserves	Million cubic feet		Percent of total	
	1970	1971	1970	1971
First 10 companies by rank:				
El Paso Natural Gas Co	26,746,900	25,186,100	15.8	15.9
Tennessee Gas Pipeline Division Tenneco	18,188,079	17,582,419	10.7	11.1
Northern Natural Gas Co	13,748,646	13,620,456	8.1	8.6
Natural Gas Pipeline Co. of America	10,772,511	10,061,205	6.3	6.4
United Gas Pipeline Co	10,316,117	9,017,378	6.1	5.7
United Fuel Gas Co	8,768,084	------------	5.2	------------
Transcontinental Gas Pipeline Corp	9,826,855	8,085,867	5.8	5.1
Columbia Gas Transmission Corp	------------	8,993,706	------------	5.8
Michigan Wisconsin Pipeline Co	8,353,799	7,880,179	4.9	5.0
Texas Eastern Transmission Corp	7,509,265	6,503,239	4.4	4.1
Arkansas Louisiana Gas Co	6,619,466	5,968,565	3.9	3.8
10 companies total	120,849,722	112,899,114	71.2	71.5
15 companies total	48,786,080	45,100,663	28.8	28.5
Total 25 major pipeline companies	169,635,802	157,999,777	100.0	100.0

Source: "The Gas Supplies of Interstate Natural Gas Pipeline Companies 1970, 1971," FPC.

TABLE 5

MANUFACTURING INDUSTRIES IN WHICH 4-FIRM CONCENTRATION RATIOS EXCEEDED 60 PERCENT IN 1966

SIC code	Industry	Concentration ratios	
		4-firm	8-firm
3717	Motor vehicles	79	83
	Steel:		
33121	Coke oven and blast furnace	[1]68	[1]76
33122	Steel ingot and semifinished shapes	[1]70	[1]84
33124	Hot rolled bars, shapes, etc	[1]63	[1]74
33126	Steel pipe and tubes	[1]61	(2)
3151	Computing and related machines	[1]63	[1]78
3721	Aircraft	67	88
3011	Tires and inner tubes	71	90
3861	Photographic equipment	67	79
3352	Aluminum rolling	65	78
2111	Cigarettes	81	100
3411	Metal cans	71	83
2841	Soap and other detergents	72	80
2824	Organic fibers	85	95
3632	Household refrigerators	72	93
2032	Canned specialties	63	79
3661	Telephone apparatus	94	97
2141	Tobacco stemming	69	91
3694	Engine electrical equipment	72	81
2052	Biscuit crackers	59	68
2647	Sanitary paper products	64	80
3612	Transformers	66	80
2087	Flavorings	63	71
3633	Household laundry equipment	79	95
3229	Pressed and blown glass products	72	85
2823	Cellulose man-made fibers	85	100
3511	Steam engines and turbines	87	98
3672	Cathode ray tubes	89	(2)
2812	Alkalies and chlorine	63	88
2046	Corn milling	67	90
2043	Cereal preparations	87	(2)
3741	Locomotives	98	99
3211	Flat glass	96	99
3691	Storage batteries	60	80
2816	Inorganic pigments	64	83
2063	Beet sugar	68	97
2813	Industrial gases	72	88
3572	Typewriters	79	99
3313	Electrometallurgical	74	91

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[1] Ratios not available for 1966. Those shown are for 1963.
[2] No ratio published by the Bureau of the Census.

Source: "Studies by the Staff of the Cabniet Committee on Price Stability," January 1969, appendix table 5, p. 93. Excludes industries with shipments of less than $500,000,000 in 1966. Basic data are from Bureau of the Census, Annual Survey of Manufacturers.

TABLE 6A

TURNOVER AMONG TOP 8 SELLERS OF NATURAL GAS TO INTERSTATE PIPELINES, 1964–69: SOUTHERN LOUISIANA

Name of producer	Ranking (high to low) by year of new sales contracts					
	1964	1965	1966	1967	1968	1969
Shell Oil Co	1	(1)	(1)	(1)	3	8
Gulf Oil Corp	2	(1)	(1)	1	(1)	(1)
Placid Oil Co	3	3	(1)	(1)	(1)	(1)
Chevron Division of California Co	4	(1)	(1)	8	(1)	(1)
Union Producing Co	5	(1)	(1)	(1)	(1)	(1)
Bradco Properties, Inc	6	(1)	(1)	(1)	(1)	(1)
Barnwell Production Co	7	(1)	(1)	(1)	(1)	(1)
John Franks	8	(1)	(1)	(1)	(1)	(1)
Mobil Oil Corp	(1)	1	4	2	(1)	4
Texaco, Inc	(1)	2	1	5	(1)	(1)
Phillips Petroleum Co	(1)	4	(1)	(1)	(1)	(1)
Kerr McGee Corp	(1)	5	(1)	(1)	(1)	(1)
Union Oil of California	(1)	6	(1)	(1)	2	2
Sunray DX Oil Co	(1)	7	(1)	(1)	(1)	(1)
Tidewater Oil Co	(1)	8	(1)	(1)	(1)	(1)
Coastal States	(1)	(1)	2	(1)	(1)	(1)
Tenneco Oil Co	(1)	(1)	3	(1)	(1)	(1)
U.S. Oil of Louisiana, Inc	(1)	(1)	5	(1)	(1)	(1)
H-Tex, Inc	(1)	(1)	6	(1)	(1)	(1)
Sun Oil Co	(1)	(1)	7	6	(1)	(1)
Louisiana Land & Explor. Co	(1)	(1)	8	(1)	(1)	(1)
Sohio Petroleum Co	(1)	(1)	(1)	3	(1)	(1)
Lake Washington, Inc	(1)	(1)	(1)	4	(1)	(1)
Gen. Am. Oil Co. of Texas	(1)	(1)	(1)	7	(1)	(1)
Humble Oil	(1)	(1)	(1)	(1)	1	1
Pan American Petroleum Corp	(1)	(1)	(1)	(1)	4	5
Union Carbide Petrol. Corp	(1)	(1)	(1)	(1)	5	(1)
Exchange Oil & Gas Co	(1)	(1)	(1)	(1)	6	(1)
Superior Oil Co	(1)	(1)	(1)	(1)	7	(1)
Transocean Oil, Inc	(1)	(1)	(1)	(1)	8	(1)
Columbia Gas Development Corp	(1)	(1)	(1)	(1)	(1)	3
Forest Oil Corp	(1)	(1)	(1)	(1)	(1)	6
Texas Gas Explor. Corp	(1)	(1)	(1)	(1)	(1)	7

[1] Not among top 8 sellers.

Source: Compiled from FPC form 2. Rankings are based on each producer's sales volumes under non et al. contracts in 1st year following the year of contract. Intrastate sales to interstate pipelines are excluded.

TABLE 6B

TURNOVER AMONG TOP 8 SELLERS OF NATURAL GAS TO INTERSTATE PIPELINES, 1964–69: PERMIAN BASIN AREA

Name of producer	Ranking (high to low) by year of new sales contracts					
	1964	1965	1966	1967	1968	1969
Sun Oil Co	1	(1)	(1)	(1)	(1)	(1)
Phillips Petroleum Co	2	(1)	(1)	(1)	(1)	(1)
Texaco, Inc	3	(1)	1	(1)	(1)	(1)
The Pure Oil Co	4	(1)	(1)	(1)	(1)	(1)
Shell Oil Co	5	5	2	(1)	(1)	(1)
Warren Petroleum Corp	6	(1)	(1)	(1)	(1)	1
Delta Drilling Co	7	2	(1)	(1)	(1)	(1)
Continental Oil Co	8	(1)	(1)	(1)	(1)	(1)
Mobil Oil Corp	(1)	1	(1)	(1)	(1)	4
Humble Oil	(1)	3	(1)	1	(1)	3
Jake L. Hamon	(1)	4	(1)	(1)	(1)	(1)
Ralph Lowe	(1)	6	(1)	(1)	(1)	(1)
Tri Service Drilling Co	(1)	7	(1)	(1)	(1)	(1)
Pan American Petroleum Corp	(1)	8	4	(1)	3	(1)
Forest Oil Co	(1)	(1)	3	(1)	2	(1)
Pecos Growers Oil Co	(1)	(1)	5	(1)	(1)	(1)
Pauley Petroleum, Inc	(1)	(1)	6	(1)	(1)	(1)
Pennzoil	(1)	(1)	7	7	(1)	(1)
American Trading & Products Co	(1)	(1)	8	(1)	(1)	(1)
Superior Oil	(1)	(1)	(1)	2	1	(1)
Paul F. Barnhardt	(1)	(1)	(1)	3	(1)	(1)
John L. Cox	(1)	(1)	(1)	4	(1)	(1)
Charles B. Read	(1)	(1)	(1)	5	(1)	(1)
Union Oil of California	(1)	(1)	(1)	6	(1)	(1)
Bronco Oil Corp	(1)	(1)	(1)	8	(1)	(1)
David Fasken	(1)	(1)	(1)	(1)	4	(1)
Monsanto Co	(1)	(1)	(1)	(1)	5	(1)
Atlantic Richfield Co	(1)	(1)	(1)	(1)	6	(1)
Darmac Corp	(1)	(1)	(1)	(1)	7	(1)
Midland National Bank	(1)	(1)	(1)	(1)	8	(1)
Texas American Oil Corp	(1)	(1)	(1)	(1)	(1)	2
Chambers & Kennedy	(1)	(1)	(1)	(1)	(1)	5
Stetco-68, Ltd	(1)	( )	(1)	(1)	(1)	6
Perry R. Bass	(1)	(1)	(1)	(1)	(1)	7
Sunset International Petroleum	(1)	(1)	(1)	(1)	(1)	8

[1] Not among top 8 sellers.

Source: Compiled from FPC form 2. Rankings are based on each producer's sales volumes under non et al. contracts in 1st year following the year of contract. Intrastate sales to interstate pipelines are excluded.

TABLE 6c.—TURNOVER AMONG TOP 8 SELLERS OF NATURAL GAS TO INTERSTATE PIPELINES, 1964–69: TEXAS GULF COAST[1]

Name of producer	Ranking (high to low) by year of new sales contracts—					
	1964	1965	1966	1967	1968	1969
Humble Oil	1	1	1	6	(2)	5
McKeen Oil Co	2	(2)	(2)	(2)	(2)	(2)
Sunray DX Oil Co	3	(2)	(2)	5	(2)	(2)
C. Howard Phifer	4	(2)	(2)	(2)	(2)	(2)
Sun Oil Co	5	8	(2)	(2)	7	2
Tidewater Oil Co	6	(2)	(2)	(2)	(2)	(2)
Coastal States	7	(2)	(2)	4	(2)	3
Cooper Petroleum Co	8	(2)	(2)	(2)	(2)	(2)
Carlton Oil Co	(2)	2	(2)	(2)	(2)	(2)
Union Producing Co	(2)	3	(2)	(2)	1	(2)
Rodney Delange	(2)	4	(2)	(2)	(2)	(2)
W. H. Doran, Jr	(2)	5	(2)	(2)	(2)	(2)
Sage Gas Gathering Co	(2)	6	(2)	(2)	(2)	(2)
Cabot Corp	(2)	7	(2)	(2)	(2)	(2)
Sinclair Oil	(2)	(2)	2	(2)	(2)	(2)
Atlantic Richfield Co	(2)	(2)	3	(2)	(2)	(2)
Texaco	(2)	(2)	4	8	4	(2)
Killam & Hurd	(2)	(2)	5	(2)	(2)	(2)
Crestmont Oil Co	(1)	(2)	6	(2)	(2)	(2)
Huisache Operating Co	(2)	(2)	7	(2)	(2)	(2)
Morris Cannon	(2)	(2)	8	(2)	(2)	(2)
Pan American Petroleum Co	(2)	(2)	(2)	1	(2)	(2)
Mobil Oil Corp	(2)	(2)	(2)	2	2	(2)
Banquete, Division of Crestmont	(2)	(2)	(2)	3	(2)	(2)
Texam Oil Corp	(2)	(2)	(2)	7	(3)	(2)
Za-Tex Corp	(2)	(2)	(2)	(2)	3	(2)
Clinton Oil Co	(2)	(2)	(2)	(2)	5	(2)
Skelly Oil Co	(2)	(2)	(2)	(2)	6	(2)
Cities Service Oil Co	(2)	(2)	(2)	(2)	8	7
Chevron Division of California Co	(2)	(2)	(2)	(2)	(2)	1
Pennzoil Producing Co	(2)	(2)	(2)	(2)	(2)	4
Larry Robinson, Inc	(2)	(2)	(2)	(2)	(2)	6
Acquitaine Oil Corp	(2)	(2)	(2)	(2)	(2)	8
Murphy Oil Corp	(2)	(2)	(2)	(2)	(2)	8

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[1] Compiled from FPC Form 2. Rankings are based on each producer's sales volumes under non et al. contracts in first year following the year of contract. Intrastate sales to interstate pipelines are excluded.

[2] Not among top 8 sellers.

Mr. NASSIKAS. I will try to make the summation shorter than the prepared statement, sir.

I have given to the stenographer a list of the Commissioners and the staff who have accompanied me to the hearing. I would like to introduce Vice Chairman Rush Moody, Jr., who is to my immediate left at the table, and Commissioner Albert Brooke, Jr., who is on my far left. Commissioner Springer, who is the fourth member of the Commission, wanted me to extend his apologies to the committee for not attending. At the same time he wished to say that the reason he didn't feel that he would wish to participate is that most everything that has transpired, transpired before he became a Commissioner which was about 5 or 6 days ago.

Senator HART. I understand. I think his judgment was good.

Mr. NASSIKAS. On my right is William P. Diener, one of my assistants. The remainder of the personnel, I have given for the record.

There are two of our colleagues present whom the subcommittee called to testify subsequent to my testimony. I understand they will testify tomorrow. That is, Mr. Wilson and Mr. Schwartz.

My prepared statement I will summarize.

Mr. CHUMBRIS. Before you get into your prepared statement and on the question of the subpenas, this subcommittee, over the past 15 or 16 years, has been very careful when requesting information from anyone, and most of the times it has been a corporation. Whether it was by subpena or not, they were very careful to make sure that the information submitted would not be made public, thus giving a competitor of a particular company certain advantages to the detriment of the person submitting that data.

In the statement that you submitted—in your order of June 22, on page 3, you refer to confidentiality. Do you see a parallel between the confidentiality that you are talking about in this order and the type of confidentiality that we have always honored in this subcommittee?

Mr. NASSIKAS. On page 7, it is further asserted in the principal Commission order:

> Accordingly, we give express notice to the subcommittee that public disclosure may well produce anticompetitive efforts in the natural gas industry and may result in taking property without * * * just compensation.

I believe that this subcommittee would be most sensitive to these rights, as part of the Senate Judiciary Committee.

To summarize, the first 10 to 11 pages concentrate on expressing to the committee how pervasive the gas supply crisis is. I mince no words in describing our gas shortage as a crisis. I have now had an opportunity to serve as Chairman of this Commission for almost 4 years.

I predicted on November 13, 1969, at the first policy hearing on natural gas before the Senate Interior Committee, that there was a deepening gas crisis, that we had to do something about it, and that policies of the Federal Power Commission should be designed to elicit more supplies of gas to better allocate the limited resources, and to amend policies of preexisting commissions to meet these objectives.

I had a further opportunity on January 30, 1970, as I remember, Chairman Hart, to testify in another policy hearing before the Subcommittee on Environment and Energy of the Senate's Commerce Committee regarding policy issues—not on gas, but electric power, environment, etc. At that hearing, I again tried to present to your committee, as part of the hearing transcript, what the problem was. I wish I had been wrong in my predictions of what the problem was on gas. I wish that greater reserves of gas had been discovered or if they had been discovered or if they were capped, that they became uncapped and somehow we were notified as to where they were, so we could be certain to regulate and establish policies that might respond to that point.

Concurrent with these views, not only before congressional committees, but also in public statements, we presented at the first Appropriations Committee hearing that I was privileged to participate in, in March of 1970—having gone through the Office of Management and Budget in October 1969—a plan for conducting the first national gas survey ever undertaken by any agency of Government. Fortunately, the funds were supplied, although not until December 1970, and we immediately embarked on a broad gas survey which I am sure we can discuss a little further later on.

What is the gas supply crisis? Well, we have had a decline of over 50 trillion cubic feet of reported gas reserves in the last 5 years. We consumed twice as much gas as we found. Our reserve-to-production ratio has declined below about 10.

Mr. CHUMBRIS. What was the ratio 10 years ago?

Mr. NASSIKAS. In 1963—as shown on page 2—18.9, according to AGA reports and according to our form 15, which is reported by the major pipelines, it was 20.2. You will see the parallel figures there. At the end of 1972, AGA reports 10.4 and the form 15—we don't currently have the figures available—was 11.4 for 1971. We are working on a computerized process that may delay us a little bit this year, but by computerizing this, I think we will be able to report these pipeline reserves much faster than we have in the past.

If we consider projections for future gas requirements, by the year 1985 our staff predicts a shortfall even assuming rather substantial supplemental sources of gas such as LNG, additional pipeline imports, SNG, reform gas projects, and coal gasification. We still have a shortfall that will require about 34 trillion cubic feet of discoveries annually between now and the year 1985 to meet demand and avoid the shortfall.

Remember, during the last 5 years, all reported reserve additions have averaged 10 trillion cubic feet a year so that our objective is to more than triple that amount.

We have had some turn around, I believe, in response to some of our policies as well as in response to more lease sales offered by the Department of the Interior. That is provided on page 4. There was an increase of 23 percent in the number of gas wells drilled in the first three quarters of 1972 compared to 1971 and an 18-percent increase in exploratory gas well footage.

This is, nevertheless, a ripple in the oceans. It is not fast enough. It is inadequate. We have to have far greater commitments to exploration and development in the United States, not only for gas, but for oil. Because, remember, as I say in my principal statement, we discover historically about 25 percent of our gas as a result of a directional drilling for oil.

Mr. CHUMBRIS. What is the lead time? Let's say I was given an increase and I decided to start exploring for more gas: When would

I be able to put that on the market to sell it to a pipeline to get it to Detroit?

Mr. NASSIKAS. The lead time, when you are rather close to existing pipeline connections, and you have to put in some laterals and other pipeline connections, even on the Outer Continental Shelf, might run 3 to 5 years.

If we are in an area such as the Outer Continental Shelf of the Atlantic—and I hope and trust that there will be lease sales that are environmentally acceptable in the course of the next year in the Atlantic—where the leadtime, even if there was a go-ahead today on a lease sale, is a minimum of 5 years before the exploration and development of that gas or whatever oil might be found reaches the market.

But after all, there is not a real shortage of gas because potentially we have a lot of gas in the ground. The U.S. Geological Survey estimates potential gas resources of from 2,100 trillion cubic feet in the ground up to about 6,100. However, some of this gas may be in areas where it is neither technologically nor economically recoverable. The recent Potential Gas Committee's report estimates about 1,146 trillion cubic feet of potential gas. There is a potential supply of gas of perhaps 30 to 65 years, depending upon whose estimate you use.

The difficulty is that potential gas is not gas that can be burned at the burner tip. Some of it is in inaccessible horizons, in remote regions, or difficult geological strata. It may be that the gas is not there in the quantities that have been predicted. On the other hand, it could turn out that there are larger quantities than had been predicted and I certainly hope so for the good of the Republic.

In the event we cannot develop gas resources to meet the demand for gas and thus serve our environmental objectives, the unfulfilled demand for gas is then transferred to other fuels. Yet, it is inaccurate to represent that all of the energy ills of the Nation are attributable to a natural gas shortage, and I will tell you why this is so in very short terms.

No. one, last year we had gas curtailments—that we didn't wish to have because this means jobs, it means industries that are not employing, it means hardship—representing a shirtfall of about 1 trillion cubic feet of gas. This was predicted as early as August 1972. We also had predictions the year before as to where the shortfall would be. We came very close in our estimates, so that there could have been some planning for the referred demand that was inevitable.

If we translate a trillion cubic feet of gas into terms of the amount of oil that this would displace, it is about 10 days' supply of oil, taking production 13 to 15 million barrels per day. So that the shortfall is 10 or 11 days' supply of oil or 10 or 11 days' production of coal.

Obviously coal (unless gasified or liquefied) does not substitute for gas in many of its uses. Oil does in many of its uses.

In fact, I presented a statement that documented this particular point before the Cost of Living Council that might be of interest to this committee if you haven't already seen it.

Senator HART. We will receive it and if it is appropriate to have it printed, certainly we will.

Mr. NASSIKAS. I have a copy of this that I brought with me and I would like to offer that for the record when I have completed my prepared statement.

There are other constraints that limit the accessibility of other energy fuels which create shortages. No. 2 fuel oil, for example, last year was blended with No. 6 residual, blended by the supplier because the No. 6 residual could not meet air quality standards. By blending with No. 2, which is low sulfur, the residual could be supplied to electric utilities, particularly on the east coast of the United States, to meet air quality standards as well as emission standards in the regions.

As for propane gas, it is amazing to me how very well-informed students of energy, including Government officials, are under the mistaken impression that the Federal Power Commission has jurisdiction over propane gas. I would like to state for the record very clearly we have no jurisdiction over propane gas. We do not control the price, the supply, or regulate propane gas in any way. So if there are propane gas shortages in the United States, which I regret, these cannot be attributable to anything the Federal Power Commission has been delegated to do by Congress.

Turning to pages 10 to 17, I have prepared a historical summation of judicial findings concerning producer regulation and industry competition. I am not going to go over it in detail. The conclusion from this section is that there are no decided cases by courts of appellate jurisdictions, particularly the U.S. Supreme Court, which state that on a national basis the natural gas industry is structurally anticompetitive or that there is an imperfect market structure which would thus require regulation. There is also no decision that says that on a national basis there is not workable competition in the natural gas industry.

So that I cannot draw on the law of decided cases and say that very wise men reviewing comprehensive evidentiary records have concluded judicially that we must regulate the natural gas industry because there is not workable competition in the gas industry. So I will simply rest for the moment with my prepared statement on that particular isue.

If there is no basis in the law from which one can determine that the absence of workable competition among gas producers forms a predicate for continued price regulations under the Natural Gas Act, we have got to now determine from economics or economic considerations whether we can reach any conclusions respecting competition in the natural gas producing industry.

Some economists may disagree with this statement. I think there will be economists who will agree also, just as I, as a lawyer, disagree with some observations of economists in which they pronounce what the precepts are of law decided by the Supreme Court. This does not exclude economists working for the Federal Power Commission, by the way.

Perfect competition is an economist's term, the definition of which is irrelevant to pragmatic economic life. Workable competition, on the other hand, normally envisions a situation where no one seller or group of sellers acting in concert has the power to choose their level of profits, either by giving less or changing more. Under these circumstances, market conditions penalize poor service and high costs. Prices are determined by supply and demand and not by a seller's own price or individual output.

At the bottom of page 18, I state, I think, a very important conclusion which is not mine but rather one contained in the Economic Report to the Federal Trade Commission of February 12, 1972. It states that coal, oil, natural gas, and uranium are sufficiently substitutable in their use by electric utilities to support the conclusion that they trade in the same economic market. This increased substitutability causes an increase in the size of the market, and tends to reduce concentration levels, erode existing market power, and promote competition. In my opinion, there is credible evidence that the decisions of sellers in the natural gas producing industry, in terms of price and output, cannot be made in isolation from fuel prices and output in the larger energy market. While many of these same natural gas sellers, likewise participate in other energy sectors, in quantitative terms, their market power is probably diminished.

Then at page 20—without listing the relevant factors in analyzing workable competition, which many of the treatise writers as well as the Justice Department and past attorneys general and present ones, I assume, utilize with respect to price discrimination, meeting rivals' prices, and predatory pricing—the Commission regulates the wellhead price for about two-thirds of the annual domestic output, thereby replacing normal market-determined pricing conditions. Under traditional producer area rate decisions, maximum ceiling prices (minimum prices in certain producing areas) are established representing the maximum rate a seller may receive if he is contractually authorized.

So that we prescribe or have prescribed rates in the past, in decided cases, all of which have been affirmed, by the way, by various U.S. courts of appeals, with the exception of the Texas gulf coast case pending in the Court of Appeals in the District of Columbia.

In these eight area rate decisions which have been decided by the Commission, by my colleagues and me, on the present Commission, rates were determined as they were by previous Commissions on the basis of average costs. When you determine on the basis of averages, a less efficient seller may find that he cannot survive in a competitive market because his cost may exceed the average; a more efficient seller can survive and can perhaps enhance his position.

The main point is that those producers who cannot demand a price higher than the maximum area ceiling will most likely direct their efforts toward those reserves having marginal costs less than such prices.

There may be uniformity, in at least the prices of new contract gas volumes in particular producing areas, but this is in response to governmental price regulations.

The long and short of it is that the marketplace has not been free to determine the price of gas with reference to its economic value, marginal costs, or commodity value in relation to substitutable fuels. And this is a large issue which is pending before the Commission and I am sure will be pending before the courts: the extent to which our Commission may depart from cost-based regulation and prescribe prices on the basis of other considerations, market consideration, commodity value, inter-fuel competition.

As you know, our Commission is divided on that issue, at least in two major cases, one of which is pending on reconsideration, and one of which where reconsideration was denied by a vote of 2 to 1.

In any event, in conjunction with price considerations, it should be noted that the industry has not been able to exercise market power in my judgment so as to exact excessive profits.

We cannot, obviously, quantify and it is dangerous to try to generalize in using broad figures. Nevertheless, I do think it is fair, as I have stated on pages 21 and 22—that it is speculative to quantify what the profit realization may be of the gas production functions of a diversified utility—gas utility or oil utility. Nevertheless, it may be observed that the average rate of profit on stockholders' equity for petroleum-related industries for the decade 1961 to 1971 was 11.4 percent as compared to an 11-percent rate for all manufacturing industries for the same period.

The gas industry's rate of growth, which is another criterion that is used in any kind of economic analysis, has likewise not been solely market determined. Over the last 3 years, we have produced on average about 22 trillion cubic feet annually Over the long term, the average growth of the gas industry was substantial, increasing from 5 trillion cubic feet in 1946 to the current level of 22 trillion cubic feet. Demand, as contrasted with output, has far outstripped our capabilities to produce—not necessarily in terms of transmission capability or pipeline, or a distribution network, but rather available supply, which can be purchased by interstate pipeline companies to meet the demands of their markets in various parts of the United States.

In round figures, 30 trillion cubic feet—28½ trillion is what I have here—is a conservative estimate of requirements for natural gas in 1975. I think this is considerably toned down by not recognizing the definite input into increased demand and pressures for increased demand for gas as a result of an environmental restraint, air quality standards to be specific. So I think the demand, if it was measured in real terms, would be far in excess of 30 trillion cubic feet, let alone 28½ trillion cubic feet in 1975.

Regrettably, we will not meet that demand. No matter what we do, there will still be a shortfall, in my opinion, in meeting the demand in 1975. While gas demand continues to increase, ability to produce sufficient supplies has decreased.

The Commission is attempting to allocate our resources more effectively. This is at page 23. For instance, on the average, about 50 percent of the gas in intrastate markets is burned under boilers, whether it is electric utilities or large commercial users of gas, industrial users. In the interstate market, perhaps 35 percent of our gas supply is burned on the boilers. Electric utilities last year generated 25 to 27 percent of their total generation by the consumption of gas under boilers, which is about 32 to 33 percent conversion efficiency.

If we can divert gas away from boiler fuel use where alternate supplies of environmentally acceptable fuels are available, then we will automatically allocate our gas resources to more efficient uses, which, I believe, is part of our economic regulatory function.

Accordingly, we have issued a series of policy statements and rulemakings which are designed to establish curtailment programs which are equitable in accordance with the highest and best use of gas, and additionally, we have a proposed rulemaking, comments for which have been received, although we have not yet acted on it, suggesting or asking for comments as to whether we should disallow the use of gas to be burned on the boilers as a matter of end use. This is a radical move.

On the other hand, we must adopt programs which will enable us to utilize this resource. If other environmentally acceptable fuels are not available to burn under boilers, then we arrive at an impasse as to whether or not we stop economic progress as to that particular end use, and that particular region, and allocate it to other regions of the United States.

There are extensive capital requirements. I think it can be argued, although I don't think very effectively, that joint bidding on leases may sometimes result in some type of collusiveness between the joint bidders. I think it would be unrealistic to say that this cannot happen or it doesn't happen. I am certain that on occasions it does happen. At the same time, the reason that you have joint bidding, in my opinion, is largely to spread the risk, to diversify the inherent risk that is involved. The amount of capital that is required today to bid on leases is far higher than it was just 3 to 5 years ago.

Two examples. The lease sale on December 31, 1972, in south Louisiana, attracted $1.7 billion of capital just for the privilege of buying a lease to explore and develop those leaseholds. Before another cent was spent, a drilling commitment for a rig, or $2 to $5 million, was spent on the Outer Continental Shelf. Pipeline companies, according to our staff's evaluation, advanced to excess of $300 million to that process in order to acquire the first right, the contract right, to acquire gas, to fill their pipelines, to meet consumer demands.

The second example is the Texas Gulf Outer Continental Shelf lease sale that was held early this week or last week—just a short time ago—in which $1.6 billion in bids were made. So that for two sales between December 1972 and June 1973, $3.3 billion was committed to exploration and development of gas and oil in our Outer Continental Shelf. I think that there could be some very constructive action taken by the Department of Interior in modifying their leasing procedures. Rather than a so-called royalty and bonus bid, which directly inures to the benefit of the Treasury, I would suggest deferral bonus bidding and a royalty which would stretch out over some period of time, yet have mandatory regulations that the leasehold must be developed within a specific period of time.

Why do I suggest this? This isn't the first time. I suggested this time and again to the Department of Interior and to committees of Congress, because in this way the smaller producer, or combinations of smaller producers, will be able to finance their enterprises in competition with larger producers which will create a healthier climate in the competition for leases than exists today. This is particularly necessary when we know that the President has recommended about 3 million acres annually over the course of the next 5 to 7 years. If we have 3 million acres annually, say three large lease sales or five large lease sales, then I believe that it becomes almost imperative that some type of program be adopted to be certain that there is a healthy competition in this industry and that there is not some restraint, because of capital requirements, or competition evidencing itself.

Barriers to entry, nevertheless, despite capital commitments, are modest in onshore activities. They are increasing in offshore activities. The only way, under your current bidding procedure, as I said earlier, that some of your smaller producers can even get involved is by working together with other larger producers or a consortium of small producers, or working with pipeline companies.

Of course, nonconventional gas supplies, such as naphtha, later coal gasification, perhaps direct gasification of oil, perhaps liquefied coal processes, and liquified natural gas, are going to enhance competition because the barriers to entry should not be prohibitive.

So, I think that there may be greater competition from that standpoint as we go on.

I don't want you to lose sight of the observation that I made at the bottom of page 27, that there is a great deal of "artificiality" in constructing such a quantitative presentation of concentration ratios, and any given economist or group of economists could spend generations arguing over the appropriate conclusions which decisionmakers should draw therefrom. I know that your subcommittee will remain cognizant of these caveats.

In assessing concentration ratios, one source gives some indices for further assessment. Generally, this theory postulates that the top 8 firms should control about 50 percent of the market before further inquiry is needed to determine the existence of a structural oligopoly.

Table 2 shows the percent of sales by large producers (over 2 million Mcf annually) to interstate pipelines for 1971. Information on intrastate producer sales, representing about one-third of annual domestic production, is unavailable. The top 4 producers accounted for about 25 percent of jurisdictional sales to interstate pipelines in 1971; the top 8 producers, about 43 percent. Ten producers made about one-half of the 1971 sales to interstate pipelines, and 300 producers accounted for about 95 percent. On the buying side, the top 4 pipelines accounted for about 36 percent of the purchases, and the top 8 pipelines, about 58 percent.

Within separate producing areas, to the extent that they are relevant, concentration ratios would be somewhat higher. In south Louisiana, for instance, the top 4 producers account for about 35 percent of the sales to interstate pipelines; the top 8 producers, slightly over 50 percent. On the purchasing side, the top 4 pipelines purchased 60 percent of the production; the top 8, about 90 percent. On a national basis, there appears to be an absence of structural imperfections, which in my opinion would indicate that workable competition does exist, at least among sellers, using concentration ratios of annual production. Table 5 simply illustrates the numerous manufacturing industries with higher concentration ratios than exist in gas production, and such industries are not subject to direct Government price regulation.

Some economists on the Commission's staff have performed analyses of concentration ratios based upon new contract volumes and uncommitted reserves, contending that this is the relevant market since it represents the volumes available for sale in any given year.

However, both these studies have major shortcomings. It only tells part of the story. Therefore, it is misleading.

As of June 30, 1972, for instance, the Commission staff reported uncommitted reserves available for sale in the lower 48 States at 3.4 trillion cubic feet. Incidentally, our supplemental report that we issued yesterday confirms that report nationally of 3.4 trillion cubic feet, and we have set forth in the staff report what the differences are between that and the initial report that was issued. The concentration ratios for the top 4 and top 8 of that 3.4 trillion cubic feet were 48 percent and 68 percent, respectively, on a national basis, and range as high as 100 percent for less than 4 producers in certain specific pricing communities. That is in table 1.

But these figures are erratic. They represent circumstances at a single point in time. Gas exploration and marketing are continuing activities which I don't believe can be meaningfully analyzed at a single point in time. Such figures should and do vary dramatically, for example, as tables 6 a, b, and c, demonstrate, depending upon the election of the time for measurement, but they are misleading for purposes of analyzing workable competition isolated from an evaluation of other factors. If uncommitted reserves were averaged over a reasonable time frame, for example, 3 to 5 years, one could anticipate concentration ratios paralleling those for new contracts, which latter ratios are comparable. Uncommitted reserves represent a small fraction of total proven reserves—about 1.5 percent—and I indicate that the average volumes have declined.

On page 32, we note that utilization of new contract volumes or uncommitted reserves does not reflect the volumes actually available for that purpose. There are gas reserves available for sale, whether through new contracts or renegotiation, from the expiration of existing flowing gas contracts. The staff's estimate is set forth on page 32 with the assumption in footnote 41 that gas reserves remaining after 1972 from contracts expiring that year approximated 2.5 trillion cubic feet annually. Thus, if we add gas reserves released from contract to other uncommitted reserves, gas volumes available for sale as of June 30, 1972, would be closer to 6 trillion cubic feet rather than 3.4 trillion cubic feet. This does not moot any conclusions to be drawn from concentration ratios of uncommitted reserve volumes. However, I believe a more credible appraisal of concentration ratios in relation to market structure should include the volumes of reserves available upon expiration of flowing gas contracts.

Then I have evaluated turn-over ratios in my principal statement. I won't go into those; they are on pages 33 to 34.

I conclude that there is credible evidence to support the thesis that workable competition exists in the natural gas producing industry. I further submit that those who would advocate continued regulation have not sustained the burden of presenting evidence that on a national basis the industry is not workably competitive. I further find no evidence of anticompetitive conduct by producers vis-a-vis the structure of the industry. I recognize there is some evidence of structural imperfections in the industry, but not to the extent that deregulation of new gas prices with appropriate monitoring and safeguards against anticompetitive conduct in any market area should not be tried on an experimental basis, through legislation by the Congress, in order to establish prices through the operation of the laws of supply and demand in an intercompetitive fuels market rather than by continual regulation of such new gas volumes dedicated to the interstate market.

Past practices have, in my opinion, been antithetical to the overall public interest, particularly before I became chairman of this Commission. Excessive volumes of gas have been diverted from jurisdictional consumers to intrastate markets, including the combustion of large volumes to generate electricity when alternate fuels could have been utilized.

More and more risk capital is being committed to nonconventional gas resources at prices to the consumer double or triple the price levels from traditional domestic sources of pipeline gas. Low gas prices have significantly contributed to artificial demands for this premium fuel, and as supplies have declined, demand and upward price pressures have shifted to other fuels.

Drilling activity in our continental resource bases, both for oil and gas, has declined, with balance of payments and national security consideration becoming more important as increasing quantities of oil are imported to meet consumer needs. I submit that the "costs" to the Nation's energy consumers from continued regulation may be far greater than would result from a market-clearing price for natural gas determined by the impersonal forces of the marketplace appropriately monitored by antitrust enforcement by the Justice Department and the Federal Trade Commission, and by the Federal Power Commission within the ambit of its regulatory responsibilities.

I submit that the attainment of the Nation's economic, social, and environmental objectives will not be met by adhering to past energy policies, including unrealistic pricing of wellhead prices of natural gas.

And I further submit that the Congress should expeditiously consider legislation at this Congress, which would return to the marketplace the responsibility of setting wellhead prices for new gas.

I might conclude finally—and I don't think this need be said, but I am going to say it—until Congress has amended the Natural Gas Act, we will continue to regulate within the constraints imposed by the Congress and the judiciary.

Thank you, Mr. Chairman, members of the subcommittee.

Senator HART. Thank you, Chairman Nassikas.

From the thrust of your testimony, and more particularly from my reading of the prepared statement in its entirety, I take it that you believe the wellhead natural gas shortage is real and that it is not contrived or artifically created by producers to force a price increase?

Mr. NASSIKAS. Yes, sir. I have no evidence to the contrary.

Senator HART. That judgment, I take it, comes from various studies and litigated cases, the basics of which I would like to examine with you, or perhaps, ask staff to examine with you.

But, before doing that, I think we ought to do two other things.

First, acknowledge the presence of the able Senator from Massachusetts, Mr. Kennedy, who joined us just after you began your testimony. Perhaps Senator Kennedy has something he would like to comment on at this point or do you want to reserve?

Senator KENNEDY. You are very kind, Mr. Chairman. I know that you have extensive questions for the witness. I appreciate it very much if I would have an opportunity to inquire very briefly of the witness himself.

Senator HART. Fine.

Senator KENNEDY. I regret, Mr. Chairman, not having an opportunity to hear your full statement and comment. I think you have heard today some of the difficulties and complications we are facing in this committee and other committees in trying to fulfill our responsibilities.

One of the points that was brought out during the course of your statement is the availability of certain information to this committee.

This morning I chaired the hearings under the Administrative Practices Committee and our witness was Attorney General Richardson who was testifying on the Freedom of Information Act, which has been the act which I believe that you relied upon in your denial of certain materials to this committee. I inquired of Mr. Richardson, as the primary spokesman and, really, the architect of the administration's position, what the justification was for any of the administrative agencies to use the Freedom of Information Act. He indicated, in response to a series of questions, that he found it extremely difficult to rationalize or justify the use of the Freedom of Information Act to the Members of Congress, particularly when they are fulfilling their legislative purpose and legislative function.

I am just wondering whether the views of your people who have been in touch with Mr. Richardson, or whether your view of the act was any different from the conclusions which have been drawn by Secretary Richardson?

Mr. NASSIKAS. Basically, as we set forth in our revised order issued just a few days ago, we believe that the Freedom of Information Act, as well as the Natural Gas Act, establishes a policy which we believe we should follow, and that is, that information that is secured on the basis that it is confidential will be maintained and its disclosure——

Senator KENNEDY. We are not talking about public disclosure today.

Mr. NASSIKAS. If the committee isn't talking about public disclosure, then it seems to me that you are observing the Freedom of Information Act which the Congress passed, which does protect privileged information against public disclosure but not against the Congress.

The chairman recited the act. I have read the act. I have studied it. We also have legal counsel's memorandum.

With reference to your other observation, as to whether we had discussed this with Attorney General Richardson, the answer to that is no, we have not sought or discussed our legal views with the Justice Department.

We have our own counsel, and as a regulatory agency we make our decisions without advice from the Justice Department.

Senator KENNEDY. Your counsel has not suggested that the Freedom of Information Act applies to the relationship between the Congress and your agency, has it?

Mr. NASSIKAS. We have a memorandum that has been delivered.

Senator KENNEDY. That is a rather simple question.

Mr. NASSIKAS. There is an implication to that effect, yes. The memorandum sets it forth.

Senator KENNEDY. That the Freedom of Information Act applies in any way to requests of Congress and any administration agency—I don't believe your counsel has given you advice that it does, has he?

Mr. NASSIKAS. The memorandum is about an 8-page memorandum that goes into the Freedom of Information Act in specific relation to the disclosure of the information which was requested by this subcommittee prior to the issuance of the subpena, so I am responding directly to your question.

Senator KENNEDY. Does it or does it not?

Mr. NASSIKAS. It does. That is what it states; and if you would like to read it, it is part of your evidence now.

Senator KENNEDY. The act is very clear and it says it does not, and if there is any kind of legislative confusion, it is one that I think underlines the importance of making sure that we do have legislative action.

And it would be useful and helpful, I think, to have a consistent viewpoint between the Attorney General and your counsel, because we are getting, as a subcommittee of the Judiciary Committee, two different positions in a matter of about 4 or 5 hours.

Mr. NASSIKAS. I don't believe Attorney General Richardson was asked a question based on the facts in this case.

Senator KENNEDY. No, he was asked about the application of the act to regulatory agencies by request of Congress.

Mr. NASSIKAS. I think that is too broad for anybody to answer.

Senator KENNEDY. Well, he answered it. He answered it quite clearly.

Mr. NASSIKAS. I don't think that he necessarily would answer it the same way if he had all the assumptions and facts.

Senator KENNEDY. We will find out.

What assurances can you give, what will be the cost again to the consumers if there is to be a deregulation? As I understand, in terms of the cost per thousand cubic feet——

Mr. NASSIKAS. I don't think that the cost to consumers can be quantified as a result of deregulation compared to what the cost to the consumers might be if there is not deregulation.

Senator KENNEDY. Let's just respond to the question. What would be the cost if there is deregulation, and then I will let you give what the cost would be if there is not.

Mr. NASSIKAS. I say one cannot quantify. I cannot quantify what the cost to consumers would be of deregulation, and deregulation of new gas is all I am talking about, not deregulation, period, for all gas.

Deregulation of new gas, defined by statute, with appropriate monitoring by the Federal Power Commission, I have defined in my principal statement. So I cannot quantify, nor do I believe any economist can quantify, except on the basis of speculation.

Senator KENNEDY. Let's speculate. Will the price go up or will it go down?

Mr. NASSIKAS. I assume the price will go up with deregulation of new gas because of the fact that gas has been maintained at artifically low levels by the regulation of the Federal Power Commission, which I head.

Senator KENNEDY. How much will it go up?

Mr. NASSIKAS. This cannot be predicted. It depends on the availability of substitute fuels and an assumed supply-price elasticity factor. It depends on the price of oil, the price of coal, the price of intrastate gas, on environmental restraints, and on import policies.

Senator KENNEDY. Let's take the given situation at the present time, the immediate situation in terms of the legislation that exists on the books with regard to environment, the general utilization of coal, and other kinds of research. Let's just take the present conditions. What is your estimate about the increase in the cost?

Mr. NASSIKAS. As I say, I have no estimate to give you.

Senator KENNEDY. You don't know. Have you done a study on that?

Mr. NASSIKAS. We have not done any studies that I know of that would indicate where the price level would go in the event of deregulation of gas.

Senator KENNEDY. Do you mean to tell me you are unable to tell the consumers of this country whether they are going to be paying more with deregulation, and how much more they are going to pay, and your testimony is that it is just a matter of speculation?

Mr. NASSIKAS. No; that is incorrect.

Senator KENNEDY. What is your answer?

Mr. NASSIKAS. My answer is that you cannot honestly quantify what the price will be but, nevertheless you can state that if there is decontrol of the gas so that you provide incentives for exploration and development, then new gas supplies should be found and developed so that the overall energy costs over the longer term should be less to consumers.

Second, consumers are interested wherever they may be situated, in my home State of New Hampshire or in yours of Massachusetts, not only in price but also in supply and unless and until we get the adequate supplies, we are not going to be able to serve consumers and unquestionably the price of other fuels will go up if there is an unfulfilled demand for gas to other fuels which are in short supply.

Let me give you one example so I can illustrate my point. In the Algonquin case which serves New England, we have authorized synthetic gas to be purchased by synthesis of naphtha from abroad at $1.80 per thousand cubic feet. That compares with a delivered price at Boston of about 60 cents for natural gas from domestic sources.

In the event we can develop additional supplies of gas, shall we say, delivered to Boston at 5 or 10 cents more than the current 60 cents delivered price, the consumers in that region will benefit.

Senator KENNEDY. Let's get back again. What are the incentives to the companies to go on out there and explore further?

Mr. NASSIKAS. In the event of decontrol?

Senator KENNEDY. Yes.

Mr. NASSIKAS. The incentives are that if we decontrol and if the leases are available, both of which are required, the producers are going to develop more gas. They are going to find gas. They are going to start getting a return commensurate with their risk investment and they are going to be able to dedicate new gas supplies to the interstate market. Remember, much of our gas in Texas has flowed into intrastate markets. In fact, the Federal Power Commission has substantially contributed to the development of the Republic of Texas by its low price policies which divert gas from the northern interstate markets to Texas intrastate consumers.

Senator KENNEDY. Is the investment return commensurate with their investment going to mean higher prices for the consumer?

Mr. NASSIKAS. It may mean higher prices for the consumers temporarily, but not higher prices from the standpoint of the overall gas supply to consumers.

Senator KENNEDY. Let's take the person who now uses the gas for cooking. Is that going to mean higher prices? For what period of time is your estimate?

Mr. NASSIKAS. I can't give you an immediate estimate. I will say that if we can't decontrol or if the Federal Power Commission is not authorized by Congress to regulate on the basis of market forces, then the last costly alternate to supplies that are not forthcoming has to be LNG or coal gasification or has to be more gas from Canada which we can't get even at higher prices.

In all of these instances, in the event you don't decontrol, you are dealing with gas that is more than a dollar delivered to the east coast of the United States.

Senator KENNEDY. Mr. Chairman, I thought that the Power Commission and the other regulatory agencies existed for the development, the acquiring of special information that would be useful and helpful to the Congress in answering the consumers who write to us wanting to know what the impact of decontrolling is going to be.

Does that mean higher prices and for how long? An adequacy of supply and for how long? Your testimony is that you are unable to give either to me or the members of this subcommittee or the consumers of this country what this process or procedure for deregulation means.

In terms of consumers of this country, the homeowners—not about some general kind of theory about what may or may not happen at some time in the future, the effect of environmental laws, the greater use of coal, the research in solar energy—they want to know what the impact is going to be for the consumers, and I do, too.

I want to find out whether the Power Commission has done any kind of study. If they were to get a deregulation, what is the impact going to be on the consumers and over what period of time? It is a question on the mind of every consumer who uses gas in this country.

Mr. NASSIKAS. I understand.

Senator KENNEDY. What are we going to tell them?

Mr. NASSIKAS. Over a period of time——

Senator KENNEDY. Let's take a 6-month period.

Mr. NASSIKAS. You can't do it.

Senator KENNEDY. You can't do it over 6 months? You can't tell what deregulation is going to cost the users of gas in this country.

Mr. NASSIKAS. As to the next 6 months, if we decontrol the impact would be virtually zero because by the time you develop new gas supplies with exploration and development, it will take at least 3 to 5 years before it is developed. So in the next 6 months, the answer to your question is: I think the impact is zero.

Senator KENNEDY. Have you done any studies from the consumers' point of view as to what decontrol would mean? Just answer that.

Mr. NASSIKAS. I haven't personally conducted the studies but we have studies called to our attention which have been reviewed by ourselves and by economists on our staff.

Senator KENNEDY. Let me ask a question. Have you done studies as to what the impact is going to be from the consumers' point of view?

Mr. NASSIKAS. When you talk of a study, I consider a study as some——

Senator KENNEDY. Just yes or no.

Mr. Nassikas. No, no study from which one can then state, based on that study, that if you deregulate, consumers are going to pay "x" for gas. But overall, the consumers of this country—and I would like to have a hearing on the issue of decontrol—are going to benefit from the Federal Power Commission's recommendation of deregulation rather than continued control of gas prices.

Senator Kennedy. You haven't done any study to show that?

Mr. Nassikas. We have years of experience with declining gas deliveries at the price levels which have been established by our Commission and the price of gas in most regions of the United States for a premium fuel is on a bargain basis.

Senator Kennedy. We have a vote. We will have to recess.

[A brief recess was taken.]

Senator Hart. The committee will be in order.

The Senator from Massachusetts hopes to return. I would like the staff to begin to examine with Chairman Nassikas the studies on which the general conclusions have been based, and Mr. Chumbris has a question to follow on the lines of what Senator Kennedy was asking.

Mr. Chumbris will ask that. I will then ask Mr. Bangert to commence.

Mr. Chumbris. Chairman Nassikas, this morning I had a colloquy with Congressman Brown along the lines of the colloquy that you had with Senator Kennedy. The point has been raised by some that the consumer would have to pay more if we continue the practices that have been in effect since 1960, or let's say somewhere in that area, on the theory that because of the capped price over those years, there had not been sufficient discovery, exploration, development, and moving of that natural gas. The shortage has been alleviated by coal, which I understand is now 35 cents for a comparable amount; oil, which I understand is now 60 cents for a comparable amount; and synthetic and liquefied natural gas, which I understand range from $1.25 to $1.50 for a comparable amount with the possibility of prices reaching as high as $2 for a thousand cubic feet.

Thus, if there is not an improvement in the price picture to encourage the development of new gas, the amount of gas has to be made up by this higher-priced gas. As the article in Business Week pointed out, the pipeline people have to keep these pipelines filled. And even if there is a deregulation, they cannot possibly get more than 15 trillion of the 30 trillion that they need in their pipelines and they have to pick that other 15 trillion at the higher price of $1.25 or $1.50.

That is what came out in the colloquy this morning. Is it your contention that you can't tell what the cost is going to be because deregulation has not yet been enacted by law and you are just meeting it on a case-by-case basis; that therefore, you can't speculate as to what the further impact is going to be under the old price and as to where you will be able to buy the substitutes and what the costs of those substitutes are going to be since they are not controlled as the natural gas is controlled by the Federal Power Commission?

Mr. Nassikas. I am in agreement with that observation but I do not think that one can honestly say where precisely a price level would be in the event that there is deregulation. I have had discussions with various economists and the consensus of the ones with whom I have discussed this issue is that the way you determine what will happen is to try it—to try it, but be certain that when you try it you have chosen monitoring and surveillance so you don't get any economic aberrations that may result in an injustice to consumers.

Actually, the least costly alternative to additional supplies of gas right now seems to be, as I said earlier. LNG or importation of naphtha and reformed gas at $1.80 in Providence, R.I. Distrigas, which is a subsidiary of Cabot Corp., authorized imports of gas there at levels that exceed $1 to the Everett, Mass., terminal.

So that if we don't spend our domestic source of gas and blend it into the price of gas that we will receive from Texas or south Louisiana, it is just bound to be higher by not decontrolling. If we decontrol, then in the course of time, we should develop substantially higher gas supplies; if we don't develop the new supplies, and a very large increment of new supplies of gas is not the result of decontrol, obviously it shouldn't be continued.

What should happen is that controls should be reimposed. To that I agree. I think one observation that would be helpful to the committee, and certainly for the record of the committee, is to take a typical residential gas heating consumer in New York City—just to pick a city in the eastern part of the United States—and apportion the various elements of cost included in the price to the residential gas consumer, to the houseowner that we are all concerned about, particularly in the Federal Power Commission. Now $1.46 is the distributor's share. The pipeline receives for transportation, 22 cents, and the producer receives around 20 cents. So that when we talk about decontrol, we are talking about the impact on the producer price, not on the other components, except as they are passed through without further return to the pipeline. So that even if the price went up another 10 cents in the example that I have given you, the price would still be $1.98, or an increase of about 5 percent.

Mr. CHUMBRIS. Just this one further question and then I will leave the questioning to the staff under the direction of the chairman.

Let's assume that right now the pipelines have commitments to serve gas and it is at 20 cents per cubic feet and there is a contract that runs for another 5 years. This gas will cover certain areas of Detroit, Milwaukee, New York City, and Philadelphia. Then a new development of homes in another part of the city, a completely new development with no commitment of gas, can't get any of this 20 cent gas, so a contract is made with the same pipeline company to take care of this area and the gas comes in at $1.80, as you have noted.

Would that mean that the citizens in this new development would have to pay on the basis of $1.80, whereas the people who were lucky enough to have their homes built previously would continue to pay under the 20 cent contract?

Mr. NASSIKAS. I think generally so, although there would be exceptions to that depending on the tariff of the company. But generally speaking, when a pipeline is in curtailment they normally don't attach new customers so the new customers that get on the line would have to pay a higher price if that incremental supply is available, unless we ourselves authorized some cutback of service of existing contracts, which we haven't done nor do we expect to.

Incidentally, the average price paid per M ft^3 in the year 1972 to gas producers by all interstate pipelines was 20.45 cents per M ft^3. In 1964, that figure was 16.59 cents. This Commission, which some people suggest is oriented to the producers, has maintained price levels to consumers of gas in the United States, insofar as the wellhead price is concerned, at 20.45 or 123.9, compared to the 1964 base of 100. So this increase is really quite modest on the average when we consider that the Consumer Price Index, for example, for all commodities has gone up from 100 in 1964 to 134.9 in 1972. The increase in the price of wellhead gas since 1964 is about 24 percent, compared to a 35-percent increase in Consumer Price Index.

Mr. CHUMBRIS. When you say 123, that is starting with 100 as a base. So actually it is only a 25-percent increase if you look at it from $16 to $20, whereas if you did the same thing in comparable meats and rents, the percentage would be much higher.

Mr. NASSIKAS. Or the price of newspapers.

Mr. CHUMBRIS. Thank you.

Senator HART. I promised to let Mr. Bangert get on with his thoughtfully prepared staff questions, but do you have any study that would assist you, us, and the public in an understanding of the relationship between price and supply?

Mr. NASSIKAS. I am sure that there are some studies. I might refer you to the Council of Economic Advisers' three successive reports, very lengthy studies in which the recommendation was made that gas be decontrolled. I don't believe they confine their recommendations to new gas. That is their study.

As for studies by our own staff, I will be glad to check with the economists on our staff. They have all kinds of studies, some of which may be useful, others of which may not be. So let me check with our economists.

Senator HART. Let's see what you can get.

It was my understanding that a study of that sort, on the relationship of price to supply, was to have been a part of the national gas reserve study, but it wasn't.

Mr. NASSIKAS. We tried. I think your recollection is 100 percent correct, Chairman Hart. We had hoped that we might be able not only to conduct studies, intensive studies on this, but to determine the elasticity of supply to price.

We are having a meeting of our Executive Advisory Committee this week; the summary reports are out. And I believe, as regards this particular aspect of our study, that we were unsuccessful at this first stage of the national gas survey in getting definitive reports.

Mr. McAvoy and other members of the faculty of MIT are working on a study in which our staff, particularly the economists and the Bureau of Natural Gas, is participating, and in which I personally have spent a good deal of time trying to determine whether we can measure the elasticity of supply to price and also measure the converse; that is, the demand constriction as the price goes up.

Mr. AcAvoy has certain assumptions and theories in his studies. A gentleman named Dr. Khazzoom presented econometric studies to the Commission in evidence that was presented in the south Louisiana proceeding. We did not adopt Dr. Khazzoom's findings because they were not credible.

At the same time, Dr. Khazzoom did make at least a contribution to the literature, although not a contribution that adjusts reasonable rates in that case. I say with all candor as to elasticity of supply to price, there are some economists who use a factor of 0.1; others go to 0.5; others go to 0.6. When you have got a spread of 1 to 6 to 7, I don't know personally what to believe until I have seen the experiment conducted, and so far as I am concerned, decontrol is experimental, just as much of our rate regulation is experimental as authorized by the courts.

Senator HART. If I understand you, I think it is fair to say that you and the Commission at this moment do not have a study on paper dealing with the relationship of price and supply that you feel is fair and complete.

Mr. NASSIKAS. Nothing definitive. I don't want to leave the impression that our staff of economists doesn't have some studies that I may not have seen; or that they have studies in their office that I have seen, but are discounted.

Senator HART. And the effort in connection with the national gas reserve study to develop a price-supply study failed?

Mr. NASSIKAS. I would say yes. I would like to just qualify the answer because of the question.

I think you put it in terms of the national gas reserve study, and it is an accurate question except that the elasticity study that we were hopeful of conducting, making some contribution, was on potential gas. We wanted to develop on the various assumptions, price assumptions, what supplies might be converted from a potential gas supply to a proved or deliverable gas supply; that is, what price levels would induce enough additional exploration and development, and what would be the response to each increment of price, taking various increments as an assumption.

Let's say an increase of 5 percent would induce a 1-percent increase in supply. An increase of 10 percent would induce another 2 percent, an increase of 20, et cetera. We had basic assumptions that we presented which are part of the public record on our gas survey and which will be published on this type of effort. However, as to the elasticity relating to decontrol, we were unsuccessful.

There is a massive report by the Legislature and Regulation Committee, Task Force, of the Technical Advisory Committee on Supply, where the position is taken on decontrol and it includes dissents by one of our economists. Mr. David Kelfrey of Ralph Nader's association, and another gentleman who was associated with so-called public interest causes. We do have that study. It is about 500 pages long, but I am not convinced one way or another by either the majority or the dissent.

Senator HART. Based on the recent track records, if we compare the period 1963–67 to the 1968–72 period, we find that we have had rate increases of about one-third and in that same period we have had approximately a 50-percent reduction in new reserve additions.

Mr. NASSIKAS. We had rate increases of one-third for what?

Senator HART. For the period 1963–67 compared to 1968–72, I am told that there was a rate increase for natural gas of about one-third.

Mr. NASSIKAS. The price paid at the wellhead was 15.59 cents. In 1967, that had gone up to 17.13 cents.

Senator HART. It was 17 cents in 1963.

Mr. Nassikas. In 1963 it was 17 cents. Then it went down because in 1964 the price we show is 15.59 cents here. This is interstate gas, interstate pipeline. Then through 1967 it had gone up to 17.13 cents. Then in 1968 and 1969, it went to 17.32 cents. It was 17.62 cents in 1970 and the average price was 18.11 cents. In 1971, it was 19.23 cents; 1972, 20.54 cents.

That was the price paid at the wellhead. The price received by pipeline is, of course, a different situation which would reflect increased costs not only for gas but for increased pipeline costs, labor, inflationary impact, et cetera.

Senator Hart. What I am looking at and the figures that suggested the increase of about a third, comparing the two periods, is a weighted average initial contract price per thousand cubic feet. This is part of a document that is not yet in the record.

In fairness to you, I suppose we should wait until an explanation is available to us clarifying the sources of those figures. And we will submit this to you in writing if our understanding is confirmed, and you can respond.

Our understanding is that comparing 1963–67 to 1968–72, there is an increase of about 33 percent—33.5 percent.

Mr. Nassikas. As I say, Mr. Chairman, I will be very happy to respond anytime that you wish me to once I know what is the predicate of the estimate. The estimate may be right insofar as it defines the estimate and it may not be right insofar as it doesn't fully define what the particular witness is talking about.

Senator Hart. All right. In the same period, we would have had a decline of about 50 percent in new reserve additions. Of course, the obvious question is, again assuming these facts, if a price increase of a third causes this to fall back 50 percent, how high do you have to go before you get none, or how high do you have to go before you get more?

Mr. Nassikas. It sounds as though it is somewhat a frustrating and empty performance, doesn't it? But it really isn't.

Senator Hart. No, it isn't if these figures——

Mr. Nassikas. I mean, Mr. Chairman, I am agreeing with you in a sense, that if the prices goes up a third and as the price goes up you get a decline in exploration, then eventually if that trend continues, what you'd better do is lower the price to get an increase in exploration. I don't think that will happen. I don't think even the economist who might have said that will agree with that.

In other words, I still believe that No. 1, there is leadtime. I am not apologizing for anything, but I have to explain. There is leadtime involved between the time we structure the policy that ends up with a nonappealable final decision, and the response of industry to that policy.

Second, there is the question of when a lease sale is going to be held. The big lease sales that we have—there was one in December 1970. Then there was a drought of lease sales until September 1972, which was a deferred sale, delayed 9 months by environmental opposition.

One more big lease sale was held in December of 1972, and then another one, Texas Gulf, last week.

If I am right to positing the view that it is 3 to 5 years before exploration and development is translated into flowing gas, that leadtime is part of the reason that there may not have been as large a response to our policies as we would have hoped.

A second part of the reason may be the fact that the lease sales are still too recent to be definitive as to what is going to be developed in that particular area. So I say that we also have to consider the impact of economic stabilization.

We have had off-again, on-again price freezes in the United States over the course of the past 3 years. Currently we are in the middle of a 60-day freeze. We deferred any action in our national rulemaking to proscribe uniform rates insofar as may be feasible because of the freeze.

The only reason I mention this is that policies which fluctuate and which prevent prices being changed in accordance with free market regulations do deter incentive.

One final point. On nonappealable final decisions, most of our product rate decisions were decided back in 1971.

However, the decisions affirming those cases came down only within the past 6 months and these are not all nonappealable final decisions. They may ultimately be appended to the U.S. Supreme Court.

So, I say again, that until there is a nonappealable final decision this is definitely a deterrent to the committing of capital at risk to exploration and development or to the dedicating of new supplies to the regulated interstate market.

It is one reason, and I think one very substantial reason, why I now advocate decontrol of new gas, whereas for over 3 years I have recommended against it because of the fact that we have not had any action by the Congress to allow the Federal Power Commission to regulate by market forces, and I don't believe we are going to get that kind of action from the Congress. I think we ought to try decontrol of new gas to turn around this deplorable lack of drilling. Also, we might say even if the response was only to our price increase—and so far it has not been very substantial—I don't think that we can quite measure what the response might have been if we had done nothing.

I am sure the response would have been far less had we not adopted policies designed to cope with the energy crisis.

Senator HART. You emphasize that the deregulation should be of new gas?

Mr. NASSIKAS. Yes; I do.

Senator HART. As I understand the administration's message, it is talking about deregulating gas.

Mr. NASSIKAS. I don't evaluate the bill that way and yet there are many aspects, and quite crucial aspects, of the administration's bill with which I do not agree.

Senator HART. If the definition in the administration's bill is the gas that shall be unregulated includes new and old——

Mr. NASSIKAS. I am opposed.

Senator HART. You are opposed?

Mr. NASSIKAS. I am opposed to the deregulation of old flowing gas. I believe that flowing gas that is committed to contract should continue to flow in accordance with the terms of that contract, subject to our regulatory review.

Let me get right to the point. As a contract for flowing gas expires—let's say 20 years have gone by and it expires as of today—under the present statute, under section 7, that dedication of gas to the interstate line cannot be abandoned without our approval. The contract can be renegotiated but it cannot be abandoned without our approval.

Second, in the event that a gas contract expires, as far as I am concerned, I don't think that we should then have an unregulated price for the gas that would be dedicated to that interstate pipeline without the restraint of classic, regulatory overview of the prudence of the purchase of that gas by the pipeline company.

Under the administration bill, I believe that a fair reading of it—yet it may not be so—is that once a contract for flowing gas expires, then the free market takes over. A new gas price, an escalated gas price, would then be charged and we could not even be empowered to review the reasonableness of that price in our pipeline regulation. I don't believe this should be done.

My concept of deregulation is very narrow. It would be applicable to new gas supplies. I do believe that a test of wells commenced for new dedications to the interstate markets, as we have adopted in some of our own orders, may be an appropriate rule to consider for decontrol, although various options, including new discoveries or dedications should be evaluated during the course of the hearings. In any event, we should retain our abandonment authority and pipeline regulatory review of the cost of purchased gas.

As to whether we should go further and decontrol or deregulate small producers, which was suggested under the sanctity of contract legislation is another question. While we didn't deregulate, we did try to relieve small producers from area ceilings and that issue is on appeal to the U.S. Supreme Court. Whether you should take that class of small producers, as we did, and try to create more competition, and then continue to regulate the old gas as well as larger gas producers but decontrol the new gas contracts subject to close surveillance and monitoring, is perhaps another question. I want to point out that legislation will be necessary to exempt small producers from price ceilings if the Supreme Court does not affirm the FPC and reverses the Court of Appeals of the District of Columbia.

The administration bill, by the way, expands our jurisdiction to direct industrial sales, which is a recommendation that I made to the administration.

I believe we should have jurisdiction over direct sales as well as sales for resale—not simply on initial rate levels, but totally. Today if a pipeline makes a sale to an electric utility or some industrial user directly and that gas is consumed, then we don't have any price control over the future supply of gas although we can allocate its use. I believe our jurisdiction should be extended to direct sales in interstate commerce in the same manner as our jurisdiction under the Natural Gas Act applies to sales for resale.

It would expand our jurisdiction. I think it is the only instance while I have been chairman that I have recommended expansion of jurisdiction because I really think the marketplace should be the primary determinant of competitive rates for new gas commitments to the interstate market rather than Commission regulation. Pending congressional amendment of the Natural Gas Act to authorize the prescription of just and reasonable rates by competitive market forces, it is my opinion that we must set rates based on cost factors as the controlling criterion.

Senator HART. Mr. Bangert?

Mr. CHUMBRIS. Mr. Chairman, would Mr. Bangert yield on one point that you raised about 1963–67 and 1968–72? Is the fact that, or the point that, the exploration may have gone down in that second 4-year period related to the increase in inflation? We had a big inflation starting about 1968 and continuing into 1972, whereas from 1967–68, at least the first 2 years were very level and they start picking up after the Vietnam war got really heated. What role would that have in a man's saying, well, I better wait a little while before I start exploring, or does that make sense?

Mr. NASSIKAS. Costs relating to exploration are certainly an important factor constraining investments without adequate return. I happen to believe, however, that the lack of the required level of investment commitment is more attributable to uncertainty of appeals, regulatory lag and environmental restraints than to inflationary costs. I also think—again, I want to emphasize that while we have had a turn around of gas, oil continues to decline and unless there is massive oil drilling or drilling for oil in the continental United States, we are not going to experience the turn around of gas of the magnitude we require. Oil and gas exploration go hand in glove. We talk of natural gas shortages in the United States. We must also face the public issue of oil shortages. In my opinion, there is a devastating oil shortage in the United States, short of meeting market demand, and with environmental restraints we also have a critical shortage of deliverable coal which should last us for 600 years if policies permitted its development.

Mr. BANGERT. Has the FPC ever obtained, voluntarily or by subpena, internal company reserve estimates to see if they square with the AGA reported reserve estimates?

Mr. NASSIKAS. No, not the internal company reserve estimates. The FPC staff conducted an uncommitted nationwide reserves study; the report was issued in February 1973.

As to proved reserves, reported by the AGA, the staff has a complete study and evaluation of the raw data in the files of the various companies and based upon a statistical data base whereby 60 to 65 percent of the report of reserves recovered and that is set forth in the study.

I sent a copy of that to Chairman Hart as well as to a member of your staff.

Mr. BANGERT. Is this the National Gas Reserves Study that you are talking about?

Mr. NASSIKAS. Yes.

Mr. BANGERT. Did you receive internal company documents at that time?

Mr. NASSIKAS. Our auditing staff is composed of engineers, geologists and others. There are about 22 of them, in addition to academicians, some State resource agencies, the U.S. Geological Survey on the Outer Continental Shelf, etc.

These task forces reviewed company records at the offices of the company and under procedures which are set forth in our reserve study. It was under the direction of Paul Root, our technical director, who is here with me. The information was analyzed and reviewed, notes were taken, and there were checks made of the data by the staff.

The information which they obtained—that is, their working notes from the company records—was then returned to the Federal Power Commission and those notes which relate to the raw data of the company are in our files today and are of a confidential status.

Mr. Bangert. Is this natural gas reserve study the one that showed that there were 9 percent less reserves than shown by the industry's AGA study?

Mr. Nassikas. Yes.

Mr. Bangert. Does the Federal Power Commission now have those internal company documents?

Mr. Nassikas. No, it does not have the documents. I thought I was clear on that. The basis of conducting the study was to evaluate company documents made available to our staff on an independent basis with no company participation.

I can have Mr. Root describe it in great detail, but in very brief terms, notes were taken. There was a system set up for uniform reporting and evaluation, so far as you can have uniformity in evaluation on judgmental factors. And the sheets that were used by the employees to transcribe the data from the company records, which were the basis of our study, are in the files of the Federal Power Commission.

The company files from which these notes were taken and evaluations were made, remain at the company under the terms of our order.

Mr. Bangert. As I understand it, then, you looked at geographic and geophysical data; is that correct?

Mr. Nassikas. I would like to request leave of the chairman. Dr. Root is an expert in this field; he conducted the study and I would be very happy to have him give you the benefit of his evaluation because it is more than simply geological data that was taken from those records. There is geological data, but there is pressure data. There are all kinds of technical data which Dr. Root is fully qualified to explain if you wish to have him respond to this question. At the leave of the chairman, I will produce him; he is right here.

Senator Hart. It would be helpful; yes.

Mr. Nassikas. As a lawyer, I know my shortcomings, so I much prefer to have an expert talk about this subject.

Mr. Bangert. It would be of assistance to the record if Dr. Root could give a bit of background with respect to the positions he held prior to coming to the Federal Power Commission to conduct the survey.

Dr. Root. My name is Paul J. Root. I am serving as technical director for the Natural Gas Survey. I am on leave of absence from the University of Oklahoma where I was associate professor of petroleum, geological engineering.

Mr. Bangert. Where were you prior to that?

Dr. Root. Prior to that, I was senior research engineer for Gulf Research and Development. Before that, I held a teaching position at the University of Texas where I obtained my Ph. D. degree. Before that, I taught at Pennsylvania State University for a year. Do you want me to go back further?

Mr. Bangert. I think that is fine. Would you go ahead and give us a little background with respect to the method in which the Natural Gas Reserve Study was conducted?

Dr. Root. In response to your specific questions, at the present time we do not have in the files estimates of reserves that were made by the companies. We have reserve estimates that were made by our own teams, teams which were composed of experts from Government and universities, who were under contract to the FPC. They went to the company offices and examined the basic raw reserve data. They examined all data that was available—well logs, which gave a record of certain physical quantities versus depth and are useful in determining reserves; pressure information; core analysis data and information on fluid analysis. That was all used by the teams to obtain an independent estimate of reserves.

They obtained estimates on a reserve-by-reserve basis and accumulated estimates for the individual reserves to come up with a field estimate.

Mr. Bangert. Did you examine fields, Doctor?

Dr. Root. We examined reserve engineering, geological, and economic data that is necessary to calculate the reserves. Yes, this was obtained from the fields.

Mr. Bangert. But did you, in fact, make a field examination?

Dr. Root. I don't quite know what you mean by a field examination. In other words, the well logs can be taken at only one time in the life of a well—when it is completed.

Their records, you know—you can go back and look at them and make independent determinations of reserve. Similarly, with the core analysis data, essentially we looked at the records and that is what you do when you make a reserve study.

Mr. Bangert. Were you able to compare on an area-by-area or, really on a field-by-field basis the results of your study with the results of the AGA study?

Dr. Root. The field team's supervisor had available to him the estimates made by, or used by, the American Gas Association for given fields. He had the estimates for all the fields in the sample and, of course, he was able to compare the two. He was able to compare our field team reserve estimates with other information that was available from—as it says in the order form 15—other sources of information.

Mr. Bangert. How were the fields sampled?

Dr. Root. Essentially, a sampling procedure was stipulated by the statistical validation team, and that procedure was used as the basis for sampling.

Mr. Bangert. Is it correct that the study sampled 145 fields?

Dr. Root. No.

Mr. Bangert. How many fields?

Dr. Root. 158 fields.

Mr. Bangert. 158?

Dr. Root. Yes.

Mr. Bangert. Out of those, how many were old, mature, large fields?

Dr. Root. I don't know how many would be old, mature, large fields, but, if you mean how many of them were major fields, which is the terminology we use in the report, there were 108 fields which were reported in that reserve going to 400 cubic feet.

Mr. BANGERT. These were large fields that had been in production for some time; is that correct?

Dr. ROOT. I am not sure just how long they had been in production. I would say there were some relatively new fields and some fields that have been in production for a long time.

Mr. BANGERT. Was that 100 percent sampled of those 108 fields?

Dr. ROOT. That is correct.

Mr. BANGERT. So that leaves us with 50 other fields. What kind of fields were those?

Dr. ROOT. They were fields that were smaller in size than 400 M ft^3.

Mr. BANGERT. Were they smaller in terms of reported reserves?

Dr. ROOT. That is correct.

Mr. BANGERT. What was your sampling percentage there?

Dr. ROOT. I don't remember the exact number. I could give that to you later.

Mr. BANGERT. Does one-half of 1 percent sound right?

Dr. ROOT. I don't really know.

Mr. BANGERT. Did you find discrepancies greater than 200 percent between the AGA reserves and your estimates in the 50 fields?

Dr. ROOT. I don't know. I don't remember those offhand. We had done work like that, but I haven't looked at that for quite some time. I don't remember what the range of the differences was.

Mr. BANGERT. Perhaps that would be furnished for the record.

Dr. ROOT. Yes, we can furnish that later. I just don't recall offhand.

Mr. BANGERT. As I understand it, you went to the offices of the companies and obtained this information. Was that information phoned back to Washington or brought back to Washington?

Dr. ROOT. There are two types of information.

First of all, the field team went to the company office. It looked at the basic raw data and it filled out its own worksheets and it computed the reserves. The actual numbers, the calculated or estimated reserves, were telephoned to Washington. The actual worksheets themselves were placed in an envelope. The envelope was sealed. It was signed by the field team leader and the representative in the company office. Those envelopes contained workpapers and were brought back to Washington in accordance with the March 9, 1972, order.

Mr. BANGERT. Do you have any idea what the cost of the national gas reserve study was?

Mr. NASSIKAS. I have a fair estimate. It amounted to around a million dollars, but that includes not only the independent gas reserve study by the FPC staff, but also the remainder of the survey, which is extremely significant, I think, including the failure.

There is a transmission section, distribution section, and a supply section; I think a fair estimate of the number of people working on it might have approximated 250 to 300, including Interior, Federal agencies, academia, consumer representatives, and industry.

Mr. BANGERT. In this study, is there any way to break down the total proven reserve figures to show the reserves by each producing area so that they can be compared to the AGA figures?

Dr. Root. No area basis—it was not designed to give us figures on an area basis.

Mr. Bangert. How about in a field-by-field basis?

Dr. Root. Yes, for the fields that were part of the sample, we have the reserves determined. The reserves in those fields were determined on a reservoir-by-reservoir basis, so those numbers are available.

However, the AGA numbers at this time are still in the hands of the independent accounting agency in accordance with the order of September 21, and they will be returned.

Mr. Bangert. To whom was this information phoned in, Dr. Root?

Dr. Root. Information on the actual reserves determined in the field was phoned to Mr. Lawrence Magnum, who is the field reserve team supervisor. The worksheets are presently in my custody in accordance with the March 9, 1972, order.

Mr. Bangert. Is the basic data that you saw the same material that was furnished to the AGA?

Dr. Root. I don't understand the question.

Mr. Bangert. As I understand it, the various companies supply AGA with reserve estimates. Is the material that you examined in the offices the same material that the companies used to report to AGA?

Dr. Root. Well, I think not, because you are talking about an actual reserve number, and we looked at basically raw data. How you determine all the factors in a given reservoir that makes up the reserves, the estimates and calculations—we looked at those things. We didn't look at just the final answer for the reserves.

Mr. Bangert. Would that be the term that the company would use to make up the final answer for AGA?

Dr. Root. Well, in a sense, you are asking me to speculate on something I know nothing about. Any person making a reserve estimation would use the same type of data that we use.

Mr. Bangert. Did you look at, for instance, any internal estimates made to the board of directors, or any internal estimates used for Internal Revenue Service, or anything like that?

Dr. Root. No.

Mr. Bangert. I would like to, at this point, discuss docket No. R–405, Mr. Chairman.

Mr. Nassikas, do you believe that the second R–405, showing uncommitted reserves, is evidence of a shortage of gas?

Mr. Nassikas. Yes.

Mr. Bangert. Was the data that you received from the 79 companies in connection with R–405 ever audited or verified by the Federal Power Commission?

Mr. Nassikas. I don't believe so. It was supplied by the companies in response to an order of the Commission, but the Federal Power Commission staff did not go into the company records or anything of that sort to determine the authenticity of what was being reported.

Mr. Bangert. So that as I understand it, the Federal Power Commission sent out an order and questionnaire form and the companies filled in the questionnaire and sent it back. Is that correct?

Mr. Nassikas. Basically. Basically under the supervision of an officer that was appointed for that segment of the R–405 reserve study.

Mr. Bangert. Are those questionnaires the documents that we have gotten under subpena this morning, Mr. Chairman?

Mr. Nassikas. I want to be sure of that. Yes, my staff so advises me. Also set forth in my formal response to the subpena was other data, worksheets.

Mr. Bangert. As I understand it, there was the original R–405 in 1970, and then there was an update of R–405.

Mr. Nassikas. Yes, the order of November 4, 1970, was the first that we issued in 405 relative to uncommitted reserve data.

Mr. Bangert. Did you get responses to that first R–405?

Mr. Nassikas. It was done differently. As I understand it from my review with the staff, the first 405 case culminated in a report filed with the Commission's secretary on March 8, 1971, by three investigating officers. Mr. Williams and Mr. Brady have gone on to greater things beyond the Federal Power Commission. Mr. Tourtellotte remains working with us.

A system of checking data was devised in that investigation. The Commission's order of November 4 specified that the information collected would be held on a confidential basis, and on November 20, 1970, a letter with a questionnaire attached was sent to 75 major producers in that case.

The letter requested the companies to present thier answers to a questionnaire to the staff in Houston, Tex., Tulsa, Okla., and Washington. This was a matter of convenience, actually, and expedition.

Subsequently, I am informed that two members of the Office of General Counsel and two members of the Bureau of Natural Gas were dispatched to these cities for the purpose of acquiring the data.

The procedures used by the staff in that data collection process were relatively simple.

First, according to Mr. Tourtellotte, a company brought the information to the staff. Second, the staff copied the company figures on FPC workpapers in the presence of company representatives. Third, the company papers were returned to the representatives immediately after copying.

Mr. Bangert. Was that material maintained in a confidential manner?

Mr. Nassikas. Yes, it was.

Fourth, the staff checked the company name off the list to indicate a response.

The staff workpapers do not indicate what figures belong to what companies. After the staff had collected information in all three geographic locations, the figures were composited and reported to the Commission.

The workpapers were deposited by Mr. Williams in a safe belonging to the Office of Administration, according to Mr. Tourtellotte, and it was Mr. Tourtellotte's opinion that the Commission required that information be held confidential even though it was not even identifiable by company name. And he further stated that in his discussions with technical people at the FPC, he was informed that some people in the industry could piece together the information provided on the investigative officer form and then make a fairly reliable guess as to which company operating in a given area submitted the figures.

I have requested my staff's general counsel to conduct a diligent search to see if those papers, even though they don't identify a company, are still available, and to date general counsel has been unable to locate them.

Mr. BANGERT. Do you know what may have happened to them?

Mr. NASSIKAS. I don't know. There is always speculation, but until the search has been completed, I am not going to speculate. For example, with reference to the papers in the latest 405, I thought that these had been inalterably destroyed and, much to my satisfaction, they had not been; I was able to direct their being retained and pieced together.

So, general counsel has been instructed to search for the workpapers, although I don't know how useful the papers are. I don't even know at this stage whether the other two investigative officers, Mr. Williams and Mr. Brady, used the identification procedures which were reported to me by Mr. Tourtellotte. I have not talked to Mr. Williams or Mr. Brady.

Mr. BANGERT. Did the Commission itself establish any ground rules respecting destruction or return of data to the companies in the first R-405?

Mr. NASSIKAS. Not to my recollection. That was some time ago. I have no recollection of anything beyond the Commission order sent to maintain or keep in confidential status.

Whatever that order stated it states. I have no recollection of any order relating to base data filed with the staff.

As far as I am concerned, any documents or field notes that are relevant to any investigation by any member of the FPC staff must and should be maintained in confidential status and not destroyed.

Mr. BANGERT. Do you have an order out at FPC, to the effect that documents can't be destroyed without your permission?

Mr. NASSIKAS. Certainly, as to all of our 405 data in the new investigation, there is an order. In fact, I supplied a memorandum to you, and although this is not an all-points memo, it makes clear to all department heads, particularly those who have custody of any information of the kind that it is to be retained, that it is not to be destroyed and it is to be made available.

And although it is not necessary to say this, regardless of whether or not this committee had requested this information, that would be the rule. When a subcommittee of the Congress requests data and we state in a response that data is confidential, as Senator Hart noted in his opening statement, our staff should certainly take heed of that and should be doubly certain that nothing is destroyed.

Mr. BANGERT. I assume that if, in fact, the data in the old R-405 has been destroyed, it should not have been as far as you are concerned.

Mr. NASSIKAS. If it is, that would be my view. I think any evidence that is collected by the staff, and which may be relevant,, should be retained.

I practiced law for over 20 years before I came down here. Let me explain that for a second. If you are going to try a lawsuit and you have evidentiary record exhibits, the working files should not be destroyed. It may be that someday somebody may file a motion. This has been my practice and policy long before I came to Washington. We don't have a mentality of destruction. We have a mentality of construction and retention.

Senator HART. I know we are going to take up the problem of the document destruction at a later hearing, but since you had made the point, it does appear that some person or persons on your staff had a different philosophy.

Mr. NASSIKAS. That is entirely conceivable. It is most regrettable, as I say. I still am enraged by the incident.

Senator HART. Parents always say that their children, when they do things they should not, are sometimes just following the examples of their elders. I suppose it is barely conceivable, in light of Watergate, that some of the elders set examples that might have influenced your Commission personnel.

Mr. NASSIKAS. I don't think the analogy is well taken as to the Commission.

Senator HART. I'm speaking of your staff personnel.

Mr. NASSIKAS. As I say, sometimes you get some very mysterious insights into staff motivation. I suppose the best way to maintain something as confidential, in a way, is to have some kind of security or to dispose of it. At the same time, when the plain language of an order states "to maintain in confidential status," I must say that the order might have added "and maintain physically, in fact, in a safe," or something of that sort, and I suppose you can always add on to an order, once you realize somebody claims he misinterpreted it. I think it was clear enough. I think it was a violation of our order.

Senator HART. It is too bad you have to be explicit on something so basic.

Mr. NASSIKAS. I am in accord with you. I would say one thing: that the evidence that we have here, of course, having pieced it all together again, does result in an uncommitted reserve study that is almost 100 percent within that limit of the issue in the first place.

There were some very minor differences that we explained in our testimony. There were differences, but what the staff issued in the first place was almost 100 percent accurate.

Mr. BANGERT. Do you mean to say there were mistakes in the document that was made available to the public on February 22?

Mr. NASSIKAS. Let me see what we did issue here as of yesterday. This is what the memorandum states, rather than the press release, and yet the press release is accurate, too.

Perhaps I ought to go through the press release briefly. There are some differences, but they are very minor. Let me state just the language here:

> Today's report corresponds to the report of February 22, 1972, indicating that uncommitted reserves available in the lower 48 States decreased from 4.6 trillion cubic feet at the end of 1969, to 4.4 trillion cubic feet as of October 1, 1970, to 3.8 trillion cubic feet as of December 31, 1971. * * *

Senator HART. Mr. Chairman, before you leave this evening, would you make that document available to the reporter?

Mr. NASSIKAS. Yes, indeed.

In the lower 48 States, as of June 30, 1972 (as reported on February 22, 1973), the volumes were 3.400.000.511.000. The revised volumes reported on June 25, 1973, for the lower 48 States were 3,401,064 million. The total for the United States, including Alaska, as of June 30, 1972, was 21,217,682 million.

The volume report on June 25 was 31,218,245 million.

Then in the Anadarko area there was a change in one figure. Volumes reported February 22, 1973, as at June 30, 1972, were 50.623 million; I am dealing with mm's here. Then, as of June 25, that figure became 51.176 million. Then on the lower 48 States, June 30, 1972, there is another fractional change and we have attached to this a memorandum by staff explaining the differences.

The overall result is largely the same, almost 100 percent the same. I will leave a copy of this with the reporter as soon as we are finished.

[The press release follows. Testimony resumes on p. 106.]

FEDERAL POWER COMMISSION,
Washington, D.C., June 25, 1973.

FEDERAL POWER COMMISSION STAFF RELEASES

REVISED REPORT ON UNCOMMITTED GAS RESERVES

The Federal Power Commission staff today released a revised report signed by Thomas J. Joyce, Chief of the Bureau of Natural Gas, of uncommitted natural gas reserves available for sale as of June 30, 1972.

The revised report incorporates reserves available for sale from one company which had not been included in the previous report issued February 22, 1973. The company did not submit its filing through the prescribed procedure.

The information was sent to the Public Files. It was not included in the report issued February 22, 1973. The total proved reserves available for sale as given in the revised report are shown in the following table:

TOTAL LARGE PRODUCER PROVED NATURAL GAS RESERVES AVAILABLE FOR SALE

[Millions of cubic feet at 14.73 lb/in²a and 60° F]

Date	Volumes reported on—	
	Feb. 22, 1973	June 25, 1973
Lower 48 States:		
Dec. 31, 1969	4,578,480	4,578,480
Oct. 1, 1970	4,374,334	4,374,834
Dec. 31, 1971	3,817,838	3,817,838
June 30, 1972	3,400,511	3,401,064
Total, United States including Alaska:		
Dec. 30, 1969	5,985,284	5,985,284
Oct. 1, 1970	6,074,131	6,074,131
Dec. 31, 1971	31,640,699	31,640,699
June 30, 1972	31,217,692	31,218,245

Today's report corresponds to the report of February 22, 1973. indicating that uncommitted reserves available in the lower 48 states (Alaska and Hawaii not included) decreased 4.6 trillion cubic feet at the end of 1969, to 4.4 trillion cubic feet as of October 1, 1970, to 3.8 trillion cubic feet as of December 31, 1971. This latter volume is equal to 1.5 percent of the proved reserves as reported for that date by the American Gas Association (A.G.A.).

When uncommitted reserves in Alaska are included, the total is 31.2 trillion cubic feet as of June 20, 1972, compared to 6.0 trillion cubic feet at the end of 1969. The substantial increase results from the addition of the volumes of Alaskan North Slope reserves which did not become available until the end of 1971. During the period December 31, 1971, to June 30, 1972, uncommitted reserves including Alaska declined from 31.6 trillion cubic feet to 31.2 trillion cubic feet.

Inclusion of the additional uncommitted reserves information not previously included changed the total uncommitted reserves available as of June 30, 1972, in the Hugoton-Anadarko as set forth in the following table:

TOTAL UNCOMMITTED NONASSOCIATED NATURAL GAS RESERVES

Date	Volumes reported—	
	Feb. 22, 1973	June 25, 1973
Hugoton-Anadarko area:		
Dec. 31, 1969	350,271	350,271
Oct. 1, 1970	384,741	384,741
Dec. 31, 1971	33,807	33,807
June 30, 1972	50,623	51,176
Lower 48 states:		
Dec. 31, 1969	3,972,972	3,972,972
Oct. 1, 1970	3,777,646	3,777,646
Dec. 31, 1971	3,102,178	3,102,178
June 30, 1972	2,758,371	2,758,924
Total, United States including Alaska:		
Dec. 31, 1969	5,248,726	5,248,726
Oct. 1, 1970	5,349,900	5,349,900
Dec. 31, 1971	4,833,170	4,883,170
June 30, 1972	4,539,363	4,539,916

In addition to the inclusion of the previously incorrectly filed information, the Tables of the report were revised to eliminate internal inconsistencies in the data reported for Associated Dissolved Gas Volumes which resulted from posting errors. Revised tables are included in the report.

JUNE 25, 1973.

Memorandum to: The Commission
From: Chief, Bureau of Natural Gas
Subject: Revised Staff Report on Nationwide Investigation: Large Producer Gas Reserves Available for Sale (Docket No. R–405)

The Commission on September 12, 1972, reissued Docket No. R–405 in order to elicit additional information to further assess the adequacy and reliability of gas supply to meet consumer demand. Responses were due by October 6, 1972. Many of the respondents filed late and 15 did not file at all. A letter was sent by the Secretary on November 15, 1972, to the non-filing companies requesting compliance. One respondent filed incorrectly and the data for that company was not included in the February 22, 1973 report. That data has now been incorporated and posting and tabulating errors which were revealed by post-audit have been corrected.

The reserve figures reported by the "Large Producers" are set forth on the attached tables. Table I contains Total Gas Reserves, Table II, Nonassociated Gas Reserves, and Table III, associated—Dissolved Gas Reserves that were available for sale on the dates specified. Footnotes for the tables follow the 3 attached tables. An overall summary is shown on the following table:

AVAILABLE FOR SALE[1]

[In trillions of cubic feet]

	Total	Non-associate	Associate-Diss.
Lower "48":			
Dec. 31, 1969	4.6	4.0	0.6
Oct. 1, 1970	4.4	3.8	.6
Dec. 31, 1971	3.8	3.1	.7
June 30, 1972	3.4	2.8	.6
Total United States:[2]			
Dec. 31, 1969	5.9	5.2	.7
Oct. 1, 1970	6.0	5.3	.7
Dec. 31, 1971	[3] 31.7	4.9	[3] 26.8
June 30, 1972	31.2	4.5	26.7

[1] Due to rounding off of numbers, numbers do not precisely correspond with data of tables I, II, and III.
[2] Includes Alaska.
[3] Includes North Slope Alaska.

The inclusion of Alaskan North North Slope reserves in the Total and Associated—Dissolved gas reserves in Tables I and II, masks any U.S. total trends, over the time span of the two investigations, because of the extremely large size of these reserves which were not reported in the first R–405 reserve report. Therefore, in order to see any significant U.S. trends the lower "48" figures should be used. There are slight upward trends as shown in Table I, Total Gas, for Federal Offshore in South Louisiana, the Hugoton-Anadarko Area, the Rocky Mountain Area, Appalachian Area, California, and Miscellaneous States. The upward trend in these areas, however, cannot overcome the overall downward trend in total gas on Table I for the lower "48". Even Alaska, with or without the North Slope reserves, shows a downward trend.

Table II, Nonassociated Gas, shows the same trends as Table I.

Table III, Associated-Dissolved Gas shows slight increasing trends in Federal Offshore Louisiana, Rocky Mountain Area, and Miscellaneous.

THOMAS J. JOYCE.

Attachments.

RESPONDENTS

Amerada Hess Corp.
American Petrofina Co. of Texas
Amoco Production Co.
Anadarko Production Co.
Ashland Oil and Refining Co.
Atlantic-Richfield Co.
Austral Oil Co., Inc.
Aztec Oil and Gas Co.
Bass Enterprises Production Co.
Belco Petroleum Corp.
Beta Development Co.
Cabot Corp.
California Co., Division Chevron Oil Co.
Champlin Petroleum Co.
Chevron Oil Co.
Cities Service Co.
Cities Service Oil Co.
Clinton Oil Co.
Coastal States Gas Producing Co.
E. Cockrell, Jr.
Colorado Oil and Gas Corp.
Coltexo Corp.
Columbia Gas Development Corp.
Continental Oil Co.
Edwin L. Cox
Diamond Shamrock Corp.
Dorchester Gas Production Co.
Exchange Oil and Gas Co.
Forest Oil Corp.
General American Oil Co. of Texas
Getty Oil Co.
Gulf Oil Corp.
Hassie Hunt Trust
Helmerich & Payne, Inc.
J. M. Huber Corporation
Humble Oil and Refining Co.
Hunt Oil Co.
The Jupiter Corp.
Kerr-McGee Corp.
Lone Star Producing Co.
Louisiana Land and Exploration Co.
LVO Corp.
Mapco Production Co.
Marathon Oil Co.
Mobil Oil Corp.
Monsanto Co.
Natural Gas and Oil Corp.
Northern Natural Gas Prod. Co.
Ocean Drilling & Exploration Co.
Petroleum Inc.
Phillips Petroleum Co.
Pioneer Production Corp.
Placid Oil Co.
Pennzoil Producing Co.
Pennzoil United, Inc.
Pubco Petroleum Corp.
The Rodman Corp.
Shell Oil and Gas Co.
Signal Oil and Gas Co.
Skelly Oil Co.
Sohio Petroleum Co.
Southern Natural Gas, Jt. Venture
Southern Union Gathering Co.
Southern Union Production Co.
Suburban Propane Gas Corp.
Sun Oil Co.
Tenneco Oil Co.
Tennessee Gas Supply Co.
Terra Resources Inc.
Texaco Inc.
Texas Gas Exploration Corp.
Texas Oil and Gas Corp.
Transocean Oil, Inc.
The Superior Oil Co.
Union Carbide Petroleum Corp. (Ashland)
Union Oil Company of California
Union Texas Petroleum
Union Pacific Railroad Co.
Warren Petroleum Corp.

TABLE I.—TOTAL LARGE PRODUCERS PROVED NATURAL GAS RESERVES AVAILABLE FOR SALE—MMCF AT 14.73 PSIA AND 60 F

Area	Total proven reserves as of Dec. 31, 1969, reported by American Gas Association	Large producers reserves available for sale		Total proven reserves as of Dec. 31, 1971, reported by American Gas Association	Large producers reserves available for sale	
		As of Dec. 31, 1969	As of Oct. 1, 1970		As of Dec. 31, 1971	As of June 30, 1972
South Louisiana	80,769,437	2,014,110	2,173,303	74,968,645	1,770,603	1,873,267
Onshore	56,666,983	1,004,206	1,117,499	47,128,723	572,157	398,830
Offshore	24,102,454	1,009,904	1,055,804	27,839,922	1,198,446	1,474,437
Federal					1,159,553	1,442,685
State					38,893	31,752
Texas gulf coast	67,540,216	1,056,974	735,326	60,844,298	631,840	544,441
Onshore		597,210	494,405		311,266	344,917
Offshore		459,764	240,921		320,574	199,524
Federal					305,574	152,624
State					15,000	46,900
Permian Basin	29,977,869	591,927	353,087	26,622,622	445,046	318,976
Hugoton-Anadarko	36,894,586	355,542	394,963	33,299,985	42,624	[1] 54,866
Other southwest	23,236,084	251,828	430,320	20,657,896	551,694	171,061
Rocky Mountain	17,514,030	198,569	205,620	17,087,479	241,031	264,807
Appalachian	6,048,395	7,463	10,846	6,588,177	10,752	11,608
Unclassified areas:						
Michigan	750,964	4,363	1,115	1,016,482	3,484	0
California	6,870,946	52,222	10,252	5,729,499	58,911	79,568
All others	304,165	45,482	60,002	625,194	61,853	82,470
Total lower "48"	269,906,692	4,578,480	4,374,834	247,440,277	3,817,838	[2] 3,401,064
Alaska	5,202,143	1,406,804	1,699,297	31,365,341	27,822,861	27,817,181
Total United States	275,108,835	5,985,284	6,074,131	278,805,618	31,640,699	[3] 31,218,245

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[1] The revised value is 54,866 mmcf rather than the previously reported 54,313 mmcf. The omission was occasioned by the failure of 1 company to file data under the proper procedures. The compnay subsequently refiled the data.

[2] The revised value is 3,401,064 mmcf rather than the previously reported 3,400,511 mmcf. The omission was occasioned by the failure of one company to file data under the proper procedures. The company subsequently refiled the data.

[3] The revised value is 31,218,245 mmcf rather than the previously reported 31,217,692 mmcf. The omission was occasioned by the failure of one company to file data under the proper procedures. The company subsequently refiled the data.

TABLE II.—TOTAL LARGE PRODUCER PROVED NONASSOCIATED NATURAL GAS RESERVES AVAILABLE FOR SALE—MMCF AT 14.73 PSIA AND 60°F

Area	Total proven reserves as of Dec. 31, 1969, reported by American Gas Association	Large producers reserves available for sale		Total proven reserves as of Dec. 31, 1971, reported by American Gas Association	Large producers reserves available for sale	
		As of Dec. 31, 1969	As of Oct. 1, 1970		As of Dec. 31, 1971	As of June 30, 1972
South Louisiana	66, 602, 555	1, 662, 668	1, 812, 726	62, 543, 880	1, 490, 827	1, 660, 762
Onshore	46, 671, 165	781, 038	936, 775	39, 066, 971	342, 441	277, 396
Offshore	19, 931, 390	881, 630	875, 951	23, 476, 909	1, 148, 386	1, 383, 366
Federal					1, 111, 400	1, 353, 273
State					36, 986	30, 093
Texas gulf coast	50, 791, 040	944, 294	648, 047	46, 081, 948	590, 129	502, 927
Onshore		484, 530	408, 926		269, 589	303, 403
Offshore		459, 764	239, 121		320, 540	199, 524
Federal					305, 540	152, 624
State					15, 000	46, 900
Permian Basin	16, 843, 155	583, 594	342, 811	15, 299, 604	339, 690	215, 728
Hugoton-Anadarko	34, 290, 945	350, 271	384, 741	30, 979, 944	33, 807	[1] 51, 176
Other southwest	16, 253, 844	142, 949	323, 046	14, 544, 882	433, 135	64, 384
Rocky Mountain	15, 215, 440	188, 023	193, 745	14, 788, 864	116, 640	132, 701
Appalachian	3, 996, 851	3, 592	5, 864	4, 042, 767	10, 550	11, 425
Unclassified areas:						
Michigan	73, 268	3, 725	200	179, 479	3, 484	0
California	2, 857, 034	43, 616	7, 150	2, 342, 432	36, 370	57, 300
All others	66, 737	45, 240	59, 316	182, 396	47, 546	62, 521
Total lower "48"	206, 990, 919	3, 972, 972	3, 777, 646	190, 986, 196	3, 102, 178	[2] 2, 758, 924
Alaska	4, 882, 363	1, 275, 754	1, 572, 254	4, 967, 421	1, 780, 992	1, 780, 992
Total United States	211, 873, 282	5, 248, 726	5, 349, 900	195, 953, 617	4, 883, 170	[3] 4, 539, 916

[1] The revised value is 51,176 rather than the previously reported 50,623 mmcf. The omission was occasioned by the failure of 1 company to file data under the proper procedures. The company subsequently refiled the data.

[2] The revised value is 2,758,924 mmcf rather than the previously reported 2,758,371 mmcf. The omission was occasioned by the failure of 1 company to file data under the proper procedures. The company subsequently refiled the data.

[3] The revised value is 4,539,916 mmcf rather than the previously reported 4,539,363 mmcf. The omission was occasioned by the failure of 1 company to file data under the proper procedures. The company subsequently refiled the data.

TABLE III.—TOTAL LARGE PRODUCER PROVED ASSOCIATED DISSOLVED NATURAL GAS RESERVES AVAILABLE FOR SALE—MMCF AT 14.73 PSIA AND 60 F

Area	Total proven reserves as of Dec. 31, 1969, reported by American Gas Association	Large producers reserves available for sale		Total proven reserves as of Dec. 31, 1971, reported by American Gas Association	Large producers reserves available for sale	
		As of Dec. 31, 1969	As of Oct. 1, 1970		As of Dec. 31, 1971	As of June 30, 1972
South Louisiana	14,166,882	351,442	360,577	12,416,106	279,776	212,505
Onshore	9,995,818	223,168	180,724	8,053,093	[1] 229,716	121,434
Offshore	4,171,064	128,274	179,853	4,363,013	50,060	91,071
Federal					48,153	89,412
State					1,907	1,659
Texas gulf coast	16,734,649	112,680	87,279	14,750,807		
Onshore		112,680	85,479		41,677	41,514
Offshore		0	1,800		34	0
Federal					34	0
State					0	0
Permian Basin	13,089,093	8,333	10,276	11,286,103	105,356	103,248
Hugoton-Anadarko	2,462,994	5,271	10,222	2,127,329	8,817	3,690
Other Southwest	6,624,707	108,879	107,274	5,719,148	118,559	106,677
Rocky Mountain	2,056,895	10,546	11,875	2,023,868	124,391	132,106
Appalachian	258,602	3,871	4,982	260,537	202	183
Unclassified areas:						
Michigan	82,186	638	915	184,541	0	0
California	3,826,608	3,606	3,102	3,175,368	22,541	22,268
All others	11,248	242	686	196,046	14,307	[2] 19,949
Total lower "48"	59,313,864	605,508	597,188	52,139,853	715,660	[3] 642,140
Alaska	319,780	131,050	127,043	26,397,920	26,041,869	26,036,189
Total United States	59,633,644	736,558	724,231	78,537,773	26,757,529	26,678,329

[1] The correct number is 229,716 mmcf rather than 265,353 mmcf which was incorrectly posted.

[2] The correct number is 19,949 mmcf rather than 19,105 mmcf which was incorrectly posted on the subtotal sheets. but included in the total.

[3] The correct number is 642,140 mmcf rather than 584,664 mmcf for this subtotal which was incorrectly tabulated and posted.

Mr. BANGERT. As I understand it, the R–405 update was classified as administratively confidential by the FPC; is that correct?

Mr. NASSIKAS. It was confidential; we never issued an order to our staff stating that a classification of this data is administratively confidential. We didn't issue an order to that effect, but the data, in terms of the order, was confidential and it was delivered under the terms of the order to the custody of a person named on the order. Therefore, any release of that data to anyone else would, of course, be administratively confidential within the staff of the Commission, even if there was no such order issued.

Mr. BANGERT. That applied also to staff members of the Commission; is that correct?

Mr. NASSIKAS. That would apply to any agency that wished to secure this information, any bureau of the Commission.

Mr. BANGERT. So that if staff within the Commission wanted to obtain that information they would be prohibited from obtaining it; is that correct?

Mr. NASSIKAS. They would be prohibited from obtaining that information without a request to the Commission and a determination by the Commission as to whether that information should be released to that person under appropriate confidential restrictions.

There was no request made to the Commission for any of their data, to my knowledge, as distinguished from the staff.

Mr. BANGERT. Do you have an order in writing with respect to how Commission personnel can get access to administratively confidential material?

Mr. NASSIKAS. I don't believe so, yet I would defer to Mr. Maxson, the executive director, who has some expertise in working with them daily. My answer to that is I don't believe so, subject to check.

Mr. BANGERT. You didn't know this, Mr. Chairman, but apparently the Economics Office did attempt to get that material to use in the recent *Belco* case.

Mr. NASSIKAS. I know it now: I didn't know it then.

Mr. BANGERT. They wanted to use the material to show high concentration ratios. Since you dissented in that case, if they had asked you for it would you have given it to them?

Mr. NASSIKAS. I don't know. Many times people ask me what I would have done had something been asked of us. I will say this, that I most certainly would not disclose information as a matter of administration, as Chairman nor would I make that kind of decision without conferring with my colleagues, because I am only Chairman. The Commission is the one that has the authority in these issues, which are the subject of a Commission order. Even if they don't have authority, I keep them informed and seek their advice as may be appropriated.

Mr. BANGERT. Has there been any order recently issued barring the Office of Economics' access to nonpublic data, except on your approval?

Mr. NASSIKAS. I think there is a memorandum that I sent that I may have submitted to you. I am not quite certain; let me check here. There is a memorandum, I know, in which I requested from memory, and the memorandum will speak for itself. Has that particular memorandum been turned over to you? Do you have it?

Mr. BANGERT. I am not sure whether we do or not.

Mr. NASSIKAS. Has that been turned over to you by our economist?

Mr. BANGERT. I don't have a memorandum you wrote. I am asking whether you wrote a memorandum.

Mr. NASSIKAS. I wrote a memorandum which stated something to the effect—and I will submit it for the record—that if the economists desire any information which is subject to the confidential orders of this Commission, they shall, through the division chief, namely Haskell Wald, make their request to me as Chairman of the Commission, rather than making the request directly to other employees.

As a matter of administration and before we have a violation of our orders, I don't want our economists or any other members of our staff scurrying around with other employees of the Commission trying to seek access to information this Commission has stated is confidential.

Mr. BANGERT. This applies to all bureaus?

Mr. NASSIKAS. It will apply to all bureaus. Since I have been chairman, I don't know of any other bureaus that sought the information. Certainly as chairman, I am not discriminating against or selecting out any bureau.

Where you have particular action by one office of the Commission, I think my order as chief executive officer ought to be read to that bureau. If there were other requests, I would issue a blanket order.

Mr. BANGERT. Isn't your Economics Office supposed to testify and present evidence in rate cases, and shouldn't it have access to that material furnished to the FPC by companies?

Mr. NASSIKAS. Not material that has been supplied to the Federal Power Commission on the basis that the integrity of that information will be maintained by the Commission as confidential. If we secure information that is to be utilized for the purpose expressed in our order, then I don't think that we are operating in good faith within the regulatory process if we decide to turn over that information for purposes that were prohibited by the initial order.

Now, the information that was requested, to be specific, was information on concentration ratios. That was in a memorandum which was subsequently—which has been filed with you now. I think it was voluntarily supplied to you before the hearing.

The Commission decided, when it was called to our attention for the first time, that the concentration ratios would not violate the confidential aspects of our order.

Accordingly, we published the concentration ratios. It is now in a public file. We supplied it also to your committee, and this can be used for any purpose at any time.

Now, going back to your hypothetical question, had the request been made by the economists back at the time they made that request to supply concentration ratios without the disclosing of names of the users, it might well have been honored at that time and the problem would never have arisen.

Mr. BANGERT. As I understand it, the Natural Gas Bureau did furnish certain concentration ratios to the economic division. However, there were mistakes in the material, and due to the time consumed in correcting these mistakes, the economic division didn't get it until the day of, or the day before the *Belco* case.

Mr. NASSIKAS. I don't know what the facts are there. As Chairman of this Commission, I do not review evidence prepared by the staff or prepared or presented by any other witnesses. I sit in an appellate capacity as delegated by the Congress, a quasi-judicial capacity, and I have honored this separation of function as chairman and will continue to honor it as long as I am chairman.

I do know if any member of the staff is aggrieved—Mr. Wald is an expert on this end as chief of the Bureau of Economics—if there is a problem that arises on that score, there is an established procedure whereby he can go to the executive director, see if he can iron this problem out there, and if it will not violate any rules of judicial conduct, and if I can resolve the problem, I will resolve the problem.

I have resolved two or three of these problems relating to commands of the Office of Economics or requests by that Office to file separate briefs or take independent views or whatever it may be.

Mr. BANGERT. Let's move on to the AR–69–1 case.

Mr. NASSIKAS. Yes.

Mr. BANGERT. As I understand that case, prices were increased by about 35 percent to 26 cents per thousand cubic feet in southern Louisiana.

Mr. NASSIKAS. That is new gas, from 20 cents to 26 cents. That case has been affirmed by the court of appeals.

Mr. BANGERT. At that time, each producer came in and indicated that the 26-cent price would provide adequate incentives for future exploration and development in southern Louisiana, and the Commission felt at that time that the price would make a major contribution to bringing forth additional gas.

Has additional gas been forthcoming?

Mr. NASSIKAS. Some has, but not in the magnitude of order we would have wished. Certainly that entire position of producers I cited and quoted——

Mr. BANGERT. That is really what I wanted to talk to you about. The producers were accorded a 15-percent return on investment, and now we find they are accorded a 29-percent return in southern Louisiana as per the *Belco* case.

Mr. NASSIKAS. I could discuss this with you for hours, if you would like. Under the *Pillsbury* doctrine. I know you and I as attorneys would not want to be disqualified by some counsel for discussing the inner workings of the *Belco* case.

I cannot respond to any evaluation on the basis of the *Pillsbury* case which does protect regulators from discussing their dissents or majority opinions freely with congressional committees to avoid the risk of being disqualified.

On that point, let's see what happens.

Mr. BANGERT. Has the Commission ordered that the higher prices must be used for additional exploration and development?

Mr. NASSIKAS. The order speaks for itself. The majority of the Commission is here today, but I am sure the majority—the law is as applicable to the majority as it is to me. For those who don't understand the *Pillsbury* doctrine, there is not a reluctance on my part to testify freely, but rather my desire not to impair my opinion in cases pending on appeal or before the Commission.

Senator HART. Let me make a comment.

Mr. NASSIKAS. Yes, Mr. Chairman.

Senator HART. The practice of the Judiciary Committee in connection with judicial nominations, for example, has been to avoid inquiry of a witness who himself has been a judge who has filed an opinion or made a decision.

Our practice is not to go beyond the four corners of the opinion, not to inquire why he reached a certain conclusion.

Mr. NASSIKAS. Yes.

Senator HART. To the extent that questions would be beyond that mark, the chairman is correct in withholding comment.

Mr. NASSIKAS. Yes.

Mr. BANGERT. Yes, sir. Well, on the draft that we received Friday the Commission cannot compel a producer to explore and develop. Is there any new legislation, other than the deregulation that you talked about today, that you recommend to cure the problem?

Mr. NASSIKAS. I am sorry. Is that on page 5 of my statement?

Mr. BANGERT. Yes, sir. Well, on the draft that we received Friday it was. Maybe it is on page 6 of the finished product; I am not sure.

Mr. NASSIKAS. Oh, yes, that is right, the finished product.

A producer needs no certificate, before that, citing the *Permian* decision. Your question is whether there ought to be legislation compelling them to produce?

Mr. BANGERT. Other than the deregulation that you suggested today, are there additional legislative steps that need to be taken in order to get gas?

Mr. NASSIKAS. I don't think the compulsion to produce can be legislated with any practicality. The heart of our free enterprise system is a kind of independent, economic, decisional process. I believe there is a law of economics—a desire to make a profit, if you will.

I happen to think profits and rewards and reasonable returns for committing capital at risk are a part of our system we should never abandon. So in the absence of some type of governmental takeover, I don't know of any way to compel production except to set up the climate which is in the public interest and get competition and develop the resources.

Senator HART. This is almost burdening an already burdened record, but, philosophically, how do you apply that to the position you take with electric utilities? You require them to produce, don't you?

Mr. NASSIKAS. I think your observation is most astute. Electric utilities or gas pipeline companies are public utilities, obligated to provide services. They have monopoly characteristics which require their continued regulation in order to protect consumers from being charged excessive rates.

Now, the characteristics of producers as was set up in the shortest and most incisive terms in the *Permian Basin* case is that they are not a class of regulated monopoly that would require regulation. They don't lend themselves to regulation on a company-to-company basis. That was tried in the late fifties and early sixties and failed. They don't have any particular service area that they serve. There are thousands that compete. Without getting into a repetition of my principal statement, I don't believe—nor does the Supreme Court believe—that producers should be regulated as public utilities, like electric utilities or pipeline companies. I don't think it is inconsistent to suggest you must have regulation of natural monopolies with phased decontrol of gas producers, but you must have continued regulation only if competition cannot be made to "work" by enforcement of antitrust laws.

Senator HART. Just for the record, the Commission in the *Permian Basin* case says:

> There is no evidence of competition between producers to make new sales by offering lower prices. On the contrary, the primary competition revealed by the record was among the pipelines to secure new gas at higher prices.

Whatever degree of competition may exist among producers is not to afford them protection under the Natural Gas Act.

Maybe it is not like a utility, but it is not like an automobile company, either.

Mr. NASSIKAS. I am not quite sure I agree with your observation. I think automobile companies and manufacturers of that kind are quite competitive in a way, except that they dominate markets to a greater degree than gas producers.

Senator HART. Let's take some other industry. I have listed auto companies in that group of six or seven highly concentrated industries. The natural gas operation may not be like an electric utility. It certainly is not like—what is our favorite area of utter confusion? Can anybody think of any other industry in America that is really competitive? I would welcome suggestions. I was going to say we will hold the record open if somebody wants to nominate an industry that meets that definition.

Mr. NASSIKAS. I would say this: We certainly ought to enforce our antitrust laws, but I don't think the producers really lend themselves to the category of being regulated like electric utilities.

In that Permian Basin decision, Mr. Chairman, your quotation was accurate, but in affirming the Commission's opinion, the Supreme Court stated:

> The records before the Commission, however, support its conclusion that competition cannot be expected to reduce field prices in the Permian Basin to the lowest possible reasonable rate consistent with the maintenance of adequate service in the public interest.

Footnote 21, chapter 13, of my principal statement comments on this point.

Mr. BANGERT. That leads into the last area that I would like to cover with you, Mr. Chairman, and that is competition, industry structure. On page 8, you indicate that the Commission has taken significant policy initiatives to stimulate competition.

Mr. NASSIKAS. I believe we have. At least on a policy basis. apart from the framework of a specific case, this Commission has tried to foster an increase, not a decrease, in competition, insofar as the gas industry is concerned. That is the point I am trying to make.

Mr. BANGERT. Well, antitrust economists tell us that competition fosters rivalry among sellers. I am wondering how the Commission has fostered rivalry among the various producers?

Mr. NASSIKAS. One of our most significant actions to foster producer competition was releasing 4,000 independent producers from price ceilings, whereas the large producers—around 100—were still subject to our total regulation.

I think that was one of the largest steps taken by any regulatory agency I know of to increase competition in a major industry. It gave the small producers a better competitive posture in relation to large producers than if they were all subject to the same area price restraints. That is one large action that we took, but there are others.

When I came to the Commission, pipelines couldn't charge the same area rates as producers. Again without getting into a decided case, we decided that it would be a good idea to place pipeline producers on a parity with regular producers. so that the pipelines' position vis-a-vis the producers' would be improved.

I don't think that in the electric utility industry—by way of analogy—electric utilities should simply rely on a source of supply without knowing something about it, any more than I feel the pipeline companies should simply wait for a producer to do something. They must try to insure the integrity of their service to the consumers. It seems logical to improve a pipeline's competitive position in relation to a producer's and thus increase competition in the industry.

I would say order 453 by which we collect price data on fossil fuels, which data is disclosed to the public and interested Government agencies, is germane. That was quite a controversial rule when we made it.

I think that merely disclosing this information increases the competitiveness of the industry, although some sectors argued it had the opposite result.

Mr. BANGERT. Reading the quotes in the *Permian* case and the *Southern Louisiana* case on pages 12 and 15, it seems to me there was indication of serious imperfections attributable to producers and purchasers in both cases.

Mr. NASSIKAS. Certainly as to *Southern Louisiana*, as set forth on page 15, it was stated by the Commission that there were serious market imperfections before the FPC. At the same time when we consider the *Austral Oil* case, the fifth circuit court of appeals observed, "At the same time there seems to be general agreement that the market is at least structurally competitive." The Supreme Court in *Permian* described producers as 'intensely competitive' (390 U.S. at 757, 88 S. Ct. at 1354). The *Permian* decision states that the Commission did not find any evidence of a competitive structure, nor was any evidence adduced by the producers to try to prove the point.

That went up on a rather narrow basis, that the court used the records before it. Certainly those decisions speak for themselves, and I think I made it clear in my principal statement that there may be imperfections of structures in some areas. There are unquestionably, as I think I said in my direct statement.

As to these imperfections, let's be certain that laws are enforced; as to those areas where you might have decontrol, if prices start rising as a result of collusion or antitrust violations, then lets us bring suit.

Mr. BANGERT. Do you hold that the Permian Basin has a market that is competitive?

Mr. NASSIKAS. I think that is an issue in the Belco decision as well as the Permian Basin case now pending before the Commission. My colleagues wrote the majority decision in Belco with which I disagree as set forth in my dissent.

Mr. BANGERT. On page 13 of your testimony you indicate that the Commission puts the burden of proof on producers to show that competition exists. And then on pages 34 and 35 you indicate that the burden is on those who contend the industry is not competitive.

Isn't that a contradiction in your statement?

Mr. NASSIKAS. I don't think so. My concluding statement is directed toward the legislative purpose these hearings are serving. And that is, it is desirable in the national interest, in public interest, to decontrol any part of the gas industry.

It seems to me if the contention against decontrol is that there are such imperfect structures in the industry that it is not workable and competitive, and therefore that we should not release regulatory controls, then the allegation must be supported by convincing evidence to prove that regulation should continue. If proponents of continued regulation do not carry the burden of persuasion, then decontrol is in order. The presumption should be that the industry is workably competitive until proven otherwise.

At the same time I will repeat it, because I don't want anybody to misunderstand. So long as the Congress has directed us to regulate, we must regulate and we shall continue to do so. We have been maintaining the price of gas at far lower than its commodity value, in accordance with the Natural Gas Act.

Senator Kennedy. Will the Senator yield at this point?

Senator Hart. Let me just read one statement to the chairman and then I shall conclude. You are an extremely able and gifted leader, so you should not be disturbed at having read back to you statements you made in the past. We are all used to that.

Mr. Nassikas. I will listen to it and I am sure I will affirm that I said it. Go ahead.

Senator Hart. "It has been suggested that the answer to regulatory problems is to deregulate producers' prices. I do not agree. At the time of a developing national supply crisis, deregulation will be contrary to the national interest. There is serious question whether interfuel competition can provide a meaningful restraint on the prices that can be charged producers in all markets. While there may be active interfuel competition in certain industrial and commercial markets, prices will be impaired in the residential market." I am sure you don't agree with that now, do you?

Mr. Nassikas. That was stated June 5, 1970, at which time I would have been chairman for not quite a year. I believed at that time that the programs and policies that the FPC and other sectors of our Government were developing would result in a constructive development of energy resources to meet our economic needs. Moreover, my remarks were directed to total deregulation—not limited and strictly monitored decontrol of new gas dedications to the interstate market. I found out after having served almost 4 years as Chairman of the FPC, that I was wrong in my judgment: That all energy sectors of the Government—and I include Congress in there—would take action that would turn around our deteriorating energy situation. The actions were not taken. I feel, as I said earlier, that with 60 or 70 decisions constantly on appeal to the courts that the FPC—most of our cases were appealed by the companies for setting rates too low, with nonavailable final decisions still not having been made in area rates—that a climate of uncertainty has not been conducive to optimum energy resource development or allocation. And it seems to me that we should try to decontrol the new gas and see if we can develop more gas supply at a reasonable price. Direct regulation of natural gas producers considered in the context of developing shortages of oil, coal, and nuclear power does not seem to be the long-range benefit efficient energy resource utilization.

At the same time I say every caveat I raised in that statement of June 1970, Mr. Chairman, is still applicable today. These are caveats, which require in conjunction with decontrol of new gas to carefully review price impacts. We should end up with more energy and I think overall savings to the consumers, if an intercompetitive fuel economy determines price levels.

The easy way for me as a regulator would be to say, all right, continue to regulate and keep that price as low as it can possibly be kept, regardless of the gas supply to consumers. That would be easy, but not in the public interest. It was these policies of the past that I failed. I don't say this critically of the predecessors on the Commission.

However, the Commission and I should benefit from the failures of regulation and not repeat the mistakes of the past.

If Congress gives us the power to regulate according to market forces, this would be a giant stride in the right direction.

I say we don't have that authority. We have to regulate on cost. We have so regulated, and because of our restraint of prices gas is the cheapest fuel in the United States today in almost all markets.

Senator HART. Senator Kennedy.

Senator KENNEDY. On that point, in other words, you just changed your mind; is that about it?

Mr. NASSIKAS. Yes. I changed my mind.

Senator KENNEDY. Around 180°?

Mr. NASSIKAS. Yes—with the exceptions previously noted—based on 3 years experience and recollecting that energy is necessary to survival of this Nation.

Senator KENNEDY. Well, you recognized that 3 years ago, didn't you?

Mr. NASSIKAS. Yes.

Senator KENNEDY. What were these decisions made in other governmental agencies that——

Mr. NASSIKAS. NEPA was not really on the way until 1970, but it didn't become very effective until late 1970. NEPA was established and applauded; this agency applauded it. The air quality amendments, the Refuse Act, the water quality amendments, the effect of environmental policies and standards upon development of resources. The slippage in our nuclear programs, the domestic oil and coal shortage—that is, the degenerating energy situation—all contributed to my belief that the regulatory structure for gas should be changed.

Back in 1970, I would not envision—I did not envision—for instance, that we would still be waiting today for a go-ahead on the Alaska pipeline where we can bring down 30 trillion cubic feet of associated gas as the oil is marketed. Economic stabilization, these are tough decisions for anybody to make—Congress, the President, or anybody else.

Economic stabilization, I think, has had its impact in retarding the development of resources. I would like to see more market regulation of new gas and see on a closely monitored basis what develops there, and I believe that overall it will benefit consumers as well as benefit our overall society.

Yet, I changed my mind, and I think people should change their minds if they find based on further experience that the national interest would be better served by revised energy policies. By way of summary, our Government leasing policies over the past 6 years have been inadequate. From 1968 to 1971, the Department of the Interior offered for lease in the offshore Federal domain less than 2 million acres of land. While the past has accelerated in the last 2 months wherein almost 1½ million additional acres of land were offered for lease, the overall program for the past 6 years has been inadequate and has contributed to the energy shortage. Ambient air quality and emission standards have been unrealistically imposed, restraining the economic accessibility of resources. Environmental opposition to resource sales, as well as to the building of powerplants or coal mining, have delayed the development of badly needed energy resources.

An unfavorable balance of payments will be accentuated by the necessity for importing a greater proportion of our oil and natural gas needs. If present trends continue, our national security will be in jeopardy. The necessity for the massive injection of new natural gas and oil supplies from domestic sources into our energy economy is, in my opinion, so vital as to affect the survival of this Nation.

These are among the reasons why my views concerning natural gas regulation today vary from my views expressed 4 years ago.

Senator KENNEDY. Your position on June 5, 1970—was there not deregulation in terms of pricing?

Mr. NASSIKAS. Yes.

Senator KENNEDY. You thought it would not be helpful, in terms of developing a national supply, if we deregulated; isn't that what you said in 1970? At the same time, developing national supply regulation would be contrary to national interest?

Mr. NASSIKAS. Yes.

Senator KENNEDY. You also thought there was a serious question, as to whether natural gas prices——

Mr. NASSIKAS. Whatever I stated then is correct for that time.

Senator KENNEDY. You said that the answer is better regulation, not its avoidance; is that correct?

Mr. NASSIKAS. Yes.

Senator KENNEDY. Can you tell us, or provide for the committee any of the studies or documents that you might have that led you to believe that with the deregulation there is going to be better supply or that the consumers are going to pay less?

Mr. NASSIKAS. One is simply determining what the response was to the policies which we adopted and the exent to which these policies have reduced further supply of gas.

We get the thoughts, evaluate these, and we also get drilling statistics.

Based on empirical experience, the fact is there has not been a turnaround in gas. That I mentioned earlier, when you were out; nor has there been a turnaround in oil, which is essential in these United States.

Senator KENNEDY. Obviously you had some evidence or some studies that led you to these conclusions about supply and price, and the answer was not deregulation. You must have made some study of that prior to the time after you had been in that job for 1 year, and obviously you come with a background of experience in this field.You were no newcomer to the field, and then we find 3 years later that you have made a complete, 180-degree turn. I think all of us, obviously, change our minds about different issues. What I would like to know is what was the material that you had that led you to make up your mind in 1970, and what is the other evidence you have in 1973. I would assume this turnaround means hundred of millions, or billions, of dollars to the American consumers, and I don't find bits of information that the Congress has about the EPA and these other statistics convincing.

I want to be able to respond to consumers in my State that other material has come forward. Based upon that material, you have come to different conclusions. That is not unusual.

For example, the Food and Drug Administration has new kinds of information. They think various drugs are useful and helpful. They find additional studies. They change their mind 180 degrees on it.

You have said you have been able to collect this material over the last 3 years, material developed by independent agencies that have responded to the kind of challenge that you put forward, material that represents the best evidence. Maybe there is some agreement or disagreement and you and your fellow commissioners, as experts charged by the Congress, have drawn that conclusion. I want to see if you have that material, or whether your response is of the general nature you have given to Senator Hart earlier.

Mr. NASSIKAS. The controlling reason is that empirically, looking back on what has happened, we are running out of gas in the United States, and consumers in the United States are entitled to gas service and not have to have their investment in various kinds of gas appliances or investment simply confiscated by lack of gas.

I have got to consider the alternatives, also, to the gas supply problems. Since 1970, we have had deepening curtailments of pipeline-supplied gas in the United States. About 5 percent of all gas supplied last year, and about 10 percent of the major pipelines, were affected.

In 1970, that did not exist. The crisis deepened even further than I thought it would between 1970 and 1973. It is the studies——

Senator KENNEDY. Which crisis is this?

Mr. NASSIKAS. The crisis of the shortage of gas to meet consumer demand.

Senator KENNEDY. Have we ascertained that there really is a shortage, or have we ascertained that the companies are holding back now in anticipation of increased revenue they are going to receive if your deregulation takes effect?

Mr. NASSIKAS. Senator Kennedy, we have found on at least three separate occasions that there is not only a crisis but an emergency existing—a national emergency with reference to gas—and I think the sooner the consumers of the United States know there is an emergency and there is not enough gas to meet industrial, commercial, or residential needs, the better off they will be.

Senator KENNEDY. There are those who believe, with the announcement of your position on deregulation and the statement that cost would increase up to approximately $1 at the wellhead, that a number of these companies are withholding the product now, and trying to create a climate of scare and fright.

Certainly Congressmen, as well as others, have indicated that, but you dismiss those allegations.

Mr. NASSIKAS. I do not dismiss any allegation that is made. But nevertheless, like you, I believe this should be weighed, and not simply accepted, as allegations. If they are supported by evidence that there is withholding, and if there is a scarcity, that sort of thing, that can be documented, then action must be taken to determine whether there has been collusive withholding in violation of antitrust laws.

I have worked on this Commission now for 4 years, and as far as I am concerned, from the evidence I have seen, we have a devastating gas shortage in the United States, and the consumers of the United States should realize it. The prices——

Senator KENNEDY. The point here, Mr. Chairman, is that this was the issue which this committee, under Chairman Hart, and the FTC were attempting to document, and without any cooperation from the FPC, without having the pertinent documents made available to it, how are we going to determine this, and how is the FTC, if the FPC does not make these documents available?

Mr. NASSIKAS. Of course, the FTC has their responsibility and we have ours.

Senator KENNEDY. And the public has theirs, too.

Mr. NASSIKAS. We have our responsibilities to the public as defined by Congress.

Senator KENNEDY. And when those rules were made, the Congress didn't have on its mind the shortage—the extent of the shortage in this country. You seem to be saying: "I am not going to get into helping the FTC, because I have my jurisdiction and the FTC has theirs. Even if the public wants to know, that is too bad, because we are not going to let the FTC have our information. After all, it is ours." That seems to be pretty narrowminded.

Mr. NASSIKAS. Let me point out hearings before the Senate Committee on Commerce, committee print, page 352. There the staff of the Federal Trade Commission goes to great lengths to point out the extent to which the Federal Power Commission cooperated with the FTC, instructing the FTC as to the methodology and methods of determining gas reserves data. This is set forth in the record of those proceedings.

Next, I would like to point out that the FTC, if they desired any information from the FPC, is perfectly privileged, as discussed in this committee print, to file a motion with the Commission and state what information they may desire.

So then if the FPC decides to aid their purposes at least it is on an open record, rather than to secure information under one pretence and than turn it over to another commission for another regulatory purpose. I don't think that is fair play to the public and I don't think I am going to abide by it.

Senator KENNEDY. Has there been any material that the Trade Commission has requested of you in trying to provide this information in the public interest that you failed to provide to them?

Mr. NASSIKAS. Not to the Federal Trade Commission that I know of.

Senator KENNEDY. Has there been any material that the FTC has requested of the Power Commission, that the Power Commission has not made available to them?

Mr. NASSIKAS. Not to the Commission itself. There may have been some staff inquiry that I am not aware of.

Senator KENNEDY. The field-by-field assessment?

Mr. NASSIKAS. There is a letter that came in, as I recall, that our general counsel called to my attention. Some employee of the FTC within the past 2 or 3 weeks was directed to Mr. Edminor, who is one of our counsels at the FPC; I don't know if he was responded to or not. They never requested anything from the Power Commission.

Senator KENNEDY. Will that material that is being requested be furnished?

Mr. NASSIKAS. I don't know. I don't know what material it was.

Senator KENNEDY. Is there any reason that it will not be furnished?

Mr. NASSIKAS. Yes; there are reasons why it may not be furnished. The reasons are if it would be violative of Commission order and good faith in the conduct of governmental affairs.

Senator KENNEDY. Would the field-by-field assessment that was conducted under the National Gas Reserve Study fall under that?

Mr. NASSIKAS. I would have to study it.

Senator KENNEDY. We will recess for just a few minutes.

[A brief recess was taken.]

Senator HART. The committee will be in order.

Senator Kennedy.

Senator KENNEDY. Thank you very much, Mr. Chairman.

In your 1970 speech, did you deal also with the percent of the production that was in the largest fuel companies, if there was not a competitive industry?

Mr. NASSIKAS. I don't recall whether I had any figures or cooperation on that at all.

Senator KENNEDY. You supplied for us some material today prepared by the Gas Supply Section that indicated you know what percent of the production was by a certain number of companies. Are you familiar with that material?

Mr. NASSIKAS. Yes, basically.

Senator KENNEDY. And for the most part, that indicated approximately 85 percent—I would think 85 would be a reasonable figure—of the production is from the four largest—this is in the percent of the reserves, excuse me, U.S. uncommitted reserves by areas and largest producers. That would indicate that approximately 85 percent or more of the reserves were held by four companies.

Mr. NASSIKAS. Let's see. Appended to my statement, table 1 indicates that, in the lower 48 States, the four largest companies controlled 51.9 percent of the uncommitted gas supply. Then, taking Alaska, the four largest control 93.9 percent of Alaskan reserves; then a weighted average for the total United States, 51.4 percent. That is what my table 1 shows.

Senator KENNEDY. Well, I was just interested—I see in the bottom line you have, for the lower 48, about 51 percent. I don't see in that list above by areas any figure that would indicate that it is less than about 63 percent, or 57 percent. Would you clarify that for me? These figures would indicate, going down them, as follows: south Louisiana, four companies, 96 percent; offshore Federal, 57 percent; offshore State, 54 percent; Texas Gulf, 89 percent. It goes right down the list.

Mr. NASSIKAS. The percentages at the bottom of table 1 are not necessarily directly related to the area percentages. The four companies controlling the largest amount of uncommitted reserves on a lower 48 States, or national basis, may be entirely different companies than the four largest for any given area. However, the percentages are related from left to right on the table on both an area or total basis.

Senator KENNEDY. The competition is not reflected, therefore, in the various areas, is it?

Mr. NASSIKAS. Well, the extent to which the larger companies control uncommitted reserves does reflect competition or noncompetition. I stated that, and I think that this is relevant. I have also stated that in addition to uncommitted reserves that we have to consider reserves that are released from firm contracts upon expiration of those contracts, which almost doubles, not quite, but raises the level of available reserves from 3.4 trillion cubic feet in the lower 48 States to 6 trillion cubic feet. But this table reflects only concentration ratios by the 4, 8, and 20 largest companies for the areas set forth in table 1.

Senator KENNEDY. Well, it appears to me that at least the four largest companies in these respective areas control about 85 percent of the reserves, although there may be a difference in the number of companies nationwide. But with regard to the particular zone areas, do the statistics that have been worked out show about 85 percent?

Mr. NASSIKAS. No, it would vary, as I stated, by areas. Let's take, for instance, June 30, 1972, the bottom line. You take the four largest companies——

Senator KENNEDY. Well, the four largest companies have 96 percent of the reserves in southern Louisiana.

Mr. NASSIKAS. Yes, this is 1971; 96.9; onshore.

Senator KENNEDY. How much competition is there if the four major companies have 96 percent?

Mr. NASSIKAS. Well, as to uncommitted reserves, I would say the four largest companies control almost 100 percent of the uncommitted reserves on that onshore, and there is relatively little competition as to those particular reserves. Remember, the pipeline companies that are buying from those producers may also have some market power, although I do feel the real marketing strength lies with the sellers of the uncommitted reserves. I don't disagree with that observation.

Senator KENNEDY. Wouldn't that be true also of the offshore States? Their companies have 84.5 percent; isn't that the same?

Mr. NASSIKAS. Yes, then, of course——

Senator KENNEDY. If you want to go to 1972, they have 94 percent.

Mr. NASSIKAS. There is one at 100 percent.

Senator KENNEDY. Right. What does that mean? You are as aware of those figures as I am. The statistics from 1971 to 1972 show there are seven areas where the percentage of concentration has actually increased.

Mr. NASSIKAS. As to those points in time, June 30, 1972, and December 30, 1971, and as to those areas where a number of producers controlled that percentage of reserves, the higher the control by four of the largest companies, then obviously, the higher the bargaining power of those four largest companies. Overall, however, on a national basis, or even as to the Federal domain here—you start getting into the Federal domain here in 1971—the four largest controlled 57 percent. However, you move up to 1972, comparing the four largest companies for the same area, that percentage decreased to 49.6, so it is less than it was in 1971.

Senator KENNEDY. As I gather in looking through this—and I am not going to take the time of the committee to do so—there are seven areas in the 1972 period where the percentage of control by the companies has actually increased, not decreased. It would appear that in a number of these particular areas designated on this table, where there is only one pipeline, the clearest indication of the competitive situation would be the areas which are indicated as having a very,

very high percentage of control by the four major companies—from 100 percent to the high 90's, and generally averaging 84.

Mr. Nassikas. I don't understand, again, the reference to the 85 percent. The exhibit on file in table 1, shows 48.4 percent for the four largest companies in the lower 48 States in June 1972, which is a decrease from 1971; 93.9 percent for Alaska; and 51 percent overall for the United States.

For the eight largest, you have 67.5 percent as of June 30, 1972. By the four largest, 93.9—I am sorry. For the lower 48, four largest, you have 48.4; eight largest, 67.5; 20 largest, 92.7.

Then across the board, including Alaska, you have four largest. 51 percent; eight largest, 73.9; 20 largest, 94.8.

Senator Kennedy. I might ask the chairman here as a point of clarification, is the competition measured on the basis of a national figure or on the basis of the area-by-area competition?

Senator Hart. I am advised that section 7 cases are regional—market areas.

Mr. Nassikas. I indicated earlier, too, that in various market areas you may have greater or lesser degrees of competition.

Senator Kennedy. In most of the areas it is less rather than more. I would let the record show those percentages. I think they provide convincing evidence of the point I am trying to make. If there is a difference interpretation of it. I would be glad to hear it. Let me ask, finally—I have some other questions, Mr. Chairman. The hour is late, you and the chairman have been very generous, and I apologize for going in and out.

Senator Hart. Please continue.

Senator Kennedy. What is the definition of "proven reserves"? That is rather a basic question.

Mr. Nassikas. It is a word of the art, actually, and proven resources have been defined in the National Gas Reserves Study conducted by our staff. On page 5 of the National Gas Reserves Study, published by our staff in May 1973, this definition is given in making estimates of the national gas reserve, the definition is cited in the reserves estimation and that, as appended here, is as follows:

> The reserves are natural gas reserves estimated to be recoverable from proved reservoirs under the economic and operating conditions existing at the time of the estimate. Such volumes of gas are expressed in cubic feet, at 14.73 pounds per square inch absolute pressure and 60 degrees F. temperature. These reserve estimates include gas of all types, regardless of availability of market, ultimate disposition or use.

Senator Kennedy. Is there such a thing as reserves that are known but not proven?

Mr. Nassikas. Yes, probable reserves are reserves associated with known fields which may be proved or disproved with additional drilling.

Senator Kennedy. What are the words of the art—known reserves, proven reserves, potential reserves?

Mr. Nassikas. Proven reserves are known reserves.

Senator Kennedy. What are the other words of the art?

Mr. Nassikas. Potential.

Senator Kennedy. Those are the only two?

Mr. Nassikas. Reserves are generally termed as either "proved" or "potential." Potential reserves are resources that either have not been found, or, if found, have not been developed enough to be termed "proved." Potential reserves may be divided into different categories based on the reliance of the estimates. The Potential Gas Committee—an industry committee—divides potential resources into the three following categories: (1) probable reserves, the most reliable of the three categories, are reserves associated with known fields but are not developed enough to be termed "proved"; (2) possible reserves, are defined as the supply from new field discoveries in formations that are productive elsewhere; and (3) speculative reserves, these are the most nebulous of the undiscovered supplies and are attributed to new field discoveries in formations or areas (such as the Atlantic offshore) not previously productive. The Potential Gas Committee's latest estimate of our domestic potential gas reserves is 1,146 trillion cubic feet which is broken down into the three categories as follows: (1) probable, 266 trillion cubic feet; (2) possible, 384 trillion cubic feet; and (3) speculative, 496 trillion cubic feet. The Geological Survey estimates that there are about 2,100 trillion cubic feet of potential recoverable undiscovered resources. However, the Survey does not divide this estimate into various categories of reliance.

Senator KENNEDY. I would like to know the amount of reserves that fall into those categories.

Mr. NASSIKAS. On proved reserves, as reported figure by the American Gas Association, as of the end of 1972, the AGA reported about 234.6 trillion cubic feet of proved reserves in the Lower 48 States, and you can add another 31.5 trillion cubic feet for Alaska, to aggregate 266.1 trillion cubic feet.

Senator KENNEDY. Does the FPC have a figure?

Mr. NASSIKAS. We have pipeline figures, which cover about 70 percent, and we have our pipeline figures only through 1971. At the end of 1971, reserves dedicated to interstate pipelines were 161.3 trillion cubic feet. We should have the 1972 figures available within the next 2 or 3 months. We have a lag because we are trying to computerize this operation of the FPC. In any event, we do have that also which we can give you. In 1970, our reserves study—that is, the staff's report—shows that there were about 261 trillion cubic feet of proved gas reserves in all fields which would include Alaska.

Senator KENNEDY. What is the Geological Survey's estimate; have they made any estimates on it?

Mr. NASSIKAS. No; the Geological Survey does not make estimates of proved reserves on a national basis, but they have estimated the undiscovered recoverable potential gas resources to be about 2,100 trillion cubic feet. This includes the continental margin to water depth of 656 feet (200 meters). The survey also estimates there is an additional 4,000 trillion cubic feet of submarginal resources for a total of 6,100 trillion cubic feet of undiscovered resources. The 4,000 trillion cubic feet of submarginal resources are not considered to be economically recoverable if found and are primarily located on the continental margin between 656 feet and 8,250 feet (2,500 meters) of water. This geologic finding will be comparable, to the Potential Gas Committee which is an industry committee, whose estimate would be 1,146 trillion cubic feet of gas, compared to 2,100. The Geological Survey's is roughly double the industry's as to "potential" reserves. As to proved reserves, the Geological Survey does not have an estimate, I am informed by my staff, although they did participate in the national gas survey as to the Outer Continental Shelf, and estimated proved reserves for fields in the sample for the Outer Continental Shelf.

Senator KENNEDY. Their track record, as I understand, has been pretty accurate over a period of years.

Mr. NASSIKAS. I would hope that when the Geological Survey says 2,100 trillion cubic feet of undiscovered potential, their report is right and industry's figures are wrong.

Senator KENNEDY. And if they are right, how big a shortage is there really?

Mr. NASSIKAS. Even if they have 2,100 trillion cubic feet of undiscovered potential, that has to be converted to a proved reserve. It has to be explored, No. 1. It is not found; it is remaining to be discovered, and it has to be explored and deveolped. And under the basic laws of economics, it will neither be explored or developed, unless the price is higher than past levels.

Senator KENNEDY. Isn't that up to the industry whether it is explored or developed?

Mr. NASSIKAS. Yes; but largely the availability of leases—most of this gas is in the Outer Continental Shelf, in the Federal domain, which requires a leasing program. In fact, on the Atlantic coast, George's Pank off Cape Cod is a very lucrative field of gas, but taking the entire Atlantic coast, about 46 to 65 trillion cubic feet of undiscovered potential resources are in the Atlantic coast. If we need gas supply to serve the consumers of the eastern part of the United States, and the Northeast where I came from, those are the reserves that should be developed.

Senator KENNEDY. Do you think the gas companies are ever going to change the policies by which they have now strangled the New England homeowners and let us import it into New England?

Mr. NASSIKAS. Let's suggest this, Senator Kennedy. Have the record state that, No. 1, residual fuel oil in New England has been a free import area for 5 to 8 years.

Senator KENNEDY. On home heating oil, No. 2, the oil industry fought us every bit of the way just as they are now fighting on the importation of the No. 2 oil.

Mr. NASSIKAS. I have recommended a relaxation of the import controls on No. 2 oil, as a member of an oil compact, and I have fought over a period of 4 years for further imports of No. 2 fuel oil, and I know it is right.

Senator KENNEDY. For you?

Mr. NASSIKAS. All right.

Senator KENNEDY. If the estimates of the Geological Survey, as I understand from the information that has been made available to me, that the 2,000 trillion cubic feet is generally considered to be a conservative figure, how many years of reserves——

Mr. NASSIKAS. Well, a 1.4-percent growth rate, which is most conservative, would be a 65-year supply, if it can all be developed. Of course, the Geological Survey would be the first to admit—and I would recommend that the committee ask them to testify—that this gas is incapable of being developed in the estimated quantity.

Senator KENNEDY. I had an opportunity to discuss with the chairman the intention of the committee to go into the whole question of the destruction of the confidential papers in the Power Commission. There was a story on this by Mr. Mintz, and the chairman has given instruction to the members of the committee that they are going to have a special hearing on this whole question. I think that that makes a great deal of sense. I just want to ask you whether there is anything you want to say on that particular issue today. In this committee we have been run through the shredder on the ITT affair and the Gray affair, and now we see this looming up again as a result of the Federal Power Commission, and I would listen to any comment you would like to make.

Mr. NASSIKAS. I have already commented extensively today, in response to the chairman's questions. The staff—I have submitted a report of what happened by our executive director. I want to say that I have denounced this action, it violated our Commission's order, we don't have a shredder, there are no instructions by the Commission to destroy, the instruction is to preserve and not destroy, and this is an incident I, of course, regret. This does not in any way indicate that there is anything going on at the FPC that is designed not to disclose records that should be disclosed within the limitations of the Freedom of Information or the Natural Gas Acts. I welcome any of you of this committee or any other committee—in fact, I agreed to a private investigation of my staff. There have been 6 to 8 hours at a time of examinations and private interrogations of my staff, by members of the subcommittee. If your conscience is clear, you can welcome any investigation and let the chips fall where they may. There is nothing to hide here.

Senator KENNEDY. On the matter I talked to you about earlier, the field-by-field investigation that was made by Mr. Lytle, I have a copy of that letter which seems to me to be entirely relevant to the Trade Commission's investigation. It is about 3 weeks old. Would you be kind enough to let us know what the response to that is going to be by the Power Commission?

Mr. NASSIKAS. It may end up as a staff response, not a Commission response. Whatever the response is, we will see to it that the committee gets a copy of it.

Senator KENNEDY. Is there any reason that we can't have a copy of the response?

Mr. NASSIKAS. We will supply you with a copy of the report. It is part of our public file, and if some staffman wants some information from another staffman at our Commission, I don't think that is anything that shouldn't be disclosed.

Senator HART. The request is for a copy of the response to that communication, and I would appreciate it if I can get it.

[The document referred to follows. Testimony resumes on p. 134.]

FEDERAL POWER COMMISSION,
Washington, D.C. June 29, 1973.

Hon. LEWIS A. ENGMAN,
Chairman, Federal Trade Commission,
Washington, D.C.

DEAR CHAIRMAN ENGMAN: I enclose a copy of the reply of Paul J. Root, Technical Director of the National Gas Survey, to a June 5, 1973 letter from Theodore L. Lytle, Jr., Attorney, Bureau of Competition, Federal Trade Commission, wherein a request was made of Edward A. Minor, Office of General Counsel, Federal Power Commission, to supply natural gas reserve estimates for certain individual fields in Offshore Louisiana to Mr. Lytle. As the attached reply indicates, such data at the Federal Power Commission is confidential, whether prepared by the United States Geological Survey and reported to the Supervisor of the independent reserve teams or by the independent reserve teams, under Commission orders of December 21, 1971, and March 9, 1972, as well as Section 8(b) of the Natural Gas Act and applicable provisions of the Freedom of Information Act.

The Federal Power Commission has received no request for disclosure of field-by-field reserve estimates conducted under this Commission's National Gas Survey from the Federal Trade Commission, as distinguished from a staff member of your Commission directing his inquiry to a member of our staff. Nor have we been advised how disclosure of such data, obtained by this Commission under express conditions that such data would be held in confidential status, would serve the regulatory purposes of the Federal Trade Commission. Similar information, relating to uncommitted natural gas reserves studies of our staff, has been sought indirectly by the Subcommittee on Antitrust and Monopoly of the Senate Judiciary Committee, for the benefit of the Federal Trade Commission, in letters to me of March 7, 1973, and June 11, 1973, from Senator Philip A. Hart, Chairman of that Subcommittee.

You no doubt fully appreciate that there are policy reasons for assuring the confidential status of reserve information, as well as the proprietary interests inherent in such data, and that it would represent a breach of faith, as well as a violation of outstanding Commission orders, and compromise the regulatory integrity of this agency for us to secure information in furtherance of our regulatory purposes on a confidential basis and then subsequently release such information to another agency charged by the Congress with different regulatory functions. We are mindful that your Commission possesses broad independent investigatory authority under Section 6 of the Federal Trade Commission Act.

Disclosure of detailed reserve estimates would undoubtedly inhibit future exploration for new gas reserves which result would operate to the detriment of the Nation as the acute gas shortage continues to produce adverse economic, social and environmental effects. Such disclosure could also inure to the benefit of a natural gas producer's competitors, particularly in highly competitvie areas such as the Outer Continental Shelf.

On the basis of outstanding Commission orders, the constraints of the applicable provisions of the Natural Gas Act and Freedom of Information Act, and the policy reasons I have mentioned herein, the Commission concurs with Dr. Root's reply to Mr. Lytle of your staff. Moreover, to disclose such reserve data as requested by Mr. Lytle could produce anticompetitive effects in the natural gas industry and result in the taking of private property without compensation and without affording the basic safeguards of due process.

Notwithstanding these considerations, we are certainly interested in proper protection of the public interest, and if the Federal Trade Commission believes such confidential data is essential to carry out its regulatory purposes, I would recommend that your Commission file an appropriate pleading with the Secretary of the Federal Power Commission for this Commission's review and action. Such a procedure would permit resolution of the issue of data disclosure on a public record, where all interested persons, including the individual natural gas companies, may be heard and the rights of all concerned may be protected under basic precepts of due process. In addition, such a procedure would avoid placing FPC employees, such as Mr. Minor, in the position of answering an FTC staff request that, if honored, would require Mr. Minor to violate outstanding FPC orders.

The Federal Power Commission desires to continue to cooperate with you within the limits of its regulatory powers and enabling statutes. I hope that the staff personnel of our respective regulatory agencies can likewise maintain the existing excellent liaison relationships in furtherance of the public interest.*

Sincerely,

JOHN N. NASSIKAS,
Chairman.

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*E.g. Hearings before the Senate Commerce Committee, March 22, 1972. Committee Print at 353.

FEDERAL TRADE COMMISSION,
Washington, D.C., June 5, 1973.

EDWARD A. MINOR, Esq.,
Office of General Counsel,
Federal Power Commission,
Washington, D.C.

DEAR MR. MINOR: The recently released Federal Power Commission's National Gas Reserves Study lists the major Offshore and smaller Offshore fields surveyed. Twenty of the 22 major Offshore fields listed and four out of five of the smaller fields listed are fields located in Offshore South Louisiana. As you know, the Federal Trade Commission's Investigation styled *In the Matter of the American Gas Association*, File No. 721 0042 *inter alia* is attempting to compare Offshore South Louisiana field-by-field estimates submitted to the A.G.A. with Offshore Louisiana field-by-field estimates used by the various companies for internal purposes. In this connection, the A.G.A. field-by-field estimates for Offshore Louisiana have been obtained as have certain company documents. The Federal Power Commission's estimates for the 24 South Louisiana Offshore fields selected for their survey are needed to provide another means of verification and cross reference. In our interest to be as thorough as possible, the Federal Power Commission's reserve estimates for those Offshore Louisiana fields listed in Table 4, p. 22 entitled "Major Offshore Fields in the statistical sample" (see attachment A) and in Table 6, p. 24 entitled "Smaller Offshore Fields in the statistical sample" (see attachment B) are hereby requested.

Thanking you in advance for your cooperation.

Sincerely yours,

THEODORE L. LYTLE, Jr.,
Attorney, Bureau of Competition.

Attachments.

ATTACHMENT A

Field Name (From Table 4, p. 22; "Major Offshore Fields in the Statistical sample").

Cameron, East Block 64–63–48–49.
Cameron, West Block 180–173–174–179–181–144.
Cameron, West Blocks 17–18–47–48.
Coon Point & Ship Shoal Blocks 39–26.
Delta, West Block 25–27–24–23–22.
Eugene Island Block 266–246.
Eugene Island Block 292–293.
Grand Isle Block 43–68–71.
Main Pass Blocks 40–41–42–37–57–43.
Marsh Island, South—Mound Point—Marsh Island, South Block 23–22–34–35.
Marsh Island, Southwest—Mound Point—Rabbit Island.
Ship Shoal Block 176–177–198–199.
Ship Shoal Block 208–209–214–215–233.
Ship Shoal Blocks 28–19–27.
Timbalier, South Block 172–164–165–173–166–171.
Vermilion Block 14.
Vermilion Block 39–38–42.
Vermilion Block 66–76–57.

ATTACHMENT B

Field Name (From Table 6, p. 24; "Smaller Offshore Fields in the Statistical sample").

Cameron, East Block 24–23.
Eugene Island Blocks 231–214–230.
Ship Shoal Block 222.
Vermilion Block 16.

Federal Power Commission,
Washington, D.C., June 29, 1973.

Mr. Theodore L. Lytle, Jr.,
Federal Trade Commission,
Washington, D.C.

Dear Mr. Lytle: This will respond to your letter of June 5, 1973, to Edward Minor, Office of General Counsel, requesting that you be supplied certain Federal Power Commission reserve estimates for Offshore Louisiana gas fields, specifically for the 20 major offshore fields for Louisiana at p. 22 of the National Gas Reserves Study and for the four minor offshore fields for Louisiana at p. 24 of that study.

Under letter dated February 25, 1972, from Acting Secretary of the Interior William Pecora to Chairman John N. Nassikas, the United States Geological Survey (USGS) accepted responsibility for making reserve estimates for that portion of the National Gas Survey covering the Outer Continental Shelf and reported their reserve estimates to the Supervisor of the independent reserve teams. (See Appendix VIII to National Gas Reserves Study, May 1973). That agency performed the reserve estimates for the following major offshore fields referred to in Attachment A of your June 5 inquiry:

Cameron, East Block 64–63–48–49.
Cameron, West Block 180–173–174–179–181–144.
Cameron, West Blocks 17–18–47–48.
Delta, West Block 25–27–24–26–23–22.
Eugene Island Block 266–246.
Eugene Island Block 292–293.
Grand Isle Block 43–68–71.
Main Pass Blocks 40–41–42–37–57–43.
Marsh Island, South Block 23–22–24–35.
Ship Shoal Block 176–177–198–199.
Ship Shoal Block 208–209–214–215–233.
Timbalier, South Block 172–164–165–176–166–171.
Vermilion Block 39–38–42.
Vermilion Block 66–76–57.

The independent reserve teams, composed of members of the Commission's staff and other professional personnel made reserve estimates for the following major offshore fields:

Coon Point and Ship Shoal Blocks 39–26.
Marsh Island—Mound Point, Rabbitt Island, Ship Shoal Blocks 28–19–27.

The independent reserve teams also made the reserve estimates for the following smaller offshore fields, referred to in Attachment B of your June 5 inquiry:

Cameron, East Block 24–23.
Eugene Island Blocks 231–214–230.
Ship Shoal Block 222.
Vermilion Block 16.

The staff independent reserve teams and the USGS made reserve estimates for March Island, South—Mound Point. The staff independent reserve teams made an estimate for the state portion of Vermilion Block 14, while the USGS made the reserve estimate for the federal portion of that field.

All individual field-by-field reserve estimates, including those identified in Attachments A and B to your June 5 inquiry, whether reported to us by USGS or from the independent reserve teams, are confidential under the terms of the Commission orders of December 21, 1971 and March 9, 1972 (copies of which are enclosed). Section 8(b) of the Natural Gas Act, 15 U.S.C. 717g(b), and the Freedom of Information Act, 5 U.S.C. 552(b)(4) and (9). Accordingly, any member of the Commission staff is prohibited from disclosing these field-by-field reserve estimates to you.

Sincerely,

Paul J. Root.
Technical Director,
National Gas Survey.

Enclosures: (2)

Enclosure 1

UNITED STATES OF AMERICA, FEDERAL POWER COMMISSION

Before Commissioners: John A. Nassikas, Chairman; John A. Carver, Jr., Albert B. Brooke, Jr., Pinkney Walker, and Rush Moody, Jr.

ORDER DIRECTING STUDY AND ANALYSIS OF NATURAL GAS RESERVES AND PRESCRIBING PROCEDURES FOR THE NATIONAL GAS SURVEY

(Issued December 21, 1971)

On February 23, 1971, the Commission authorized the establishment of National Gas Survey advisory committees and prescribed procedures under which the National Gas Survey would be carried out. Subsequent Commission orders have established particular committees. Paragraph seven of these establishing orders stated that the advice and recommendations of the members of these committees may be presented to the Commission, but provided that the ultimate decisions based on the committees' advice or recommendations are reserved to the Federal Power Commission.

In our order of February 23, 1971, we stated the following:

"To accomplish the objectives of the Natural Gas Act, in providing for the ultimate consumer an adequate and reliable supply of natural gas at a reasonable price and the Nation a vital energy resource base, the Commission will direct the conduct of the Survey through the members of the Commission and its staff."

A report presenting a preliminary draft for procedures concerning a survey and analysis of natural gas reserves was received by the National Gas Survey Coordiating Comimttee on October 12, 1971, and by the National Gas Survey Exectuive Advisory Committee on October 21, 1971. The Task Force on Natural Gas Supply to the Survey's Supply Technical Advisory Committee recommended procedures for such a survey and analysis at its December 14, 1971, meeting. Those procedures, as reviewed and modified by the Commission, are attached as Appendix A. We believe that an analysis of natural gas reserves is an important step in the accomplishment of the objectives sought by the National Gas Survey.

The Commission finds:

A survey and analysis of natural gas reserves to be conducted by the National Gas Survey in the manner hereinafter prescribed is necessary and appropriate to the purposes of the Natural Gas Act and is in the public interest.

The Commission orders:

(A) A survey and analysis of natural gas reserves in the United States shall be conducted, following in general the procedures prescribed in Appendix A hereto subject to such other and further orders as the Commission may hereafter adopt.

(B) Any non-public commercial information concerning an individual natural gas company's reserves obtained during the coure of this survey and analysis shall be treated as confidential without public disclosure, by the staff of the Commission and its agents, including any accounting firm selected by the Commission to assist in this survey and analysis, unless otherwise directed by the Commission. The provisions of Section 8(b) of the Natural Gas Act [15 U.S.C. 717g(b)] and 5 U.S.C. 552(b)(4) and (9) [Freedom of Information Act] shall apply.

(C) The procedures specified in Appendix A do not preclude the undertaking of such other procedures or reserves studies or the obtaining of such further information or data relating to gas supply as may be determined by the Commission or Staff to be necessary or appropriate in carrying out the Commission's National Gas Survey to serve the public interest.

(D) The ultimate form of reporting of natural gas reserves data shall be as determined by the Commission.

(E) In order that this portion of the National Gas Survey may proceed immediately, this initial survey and analysis shall estimate reserves as of December 31, 1970, the latest date for which complete information is presently available

By the Commission.

[SEAL] KENNETH F. PLUMB, *Secretary.*

Appendix A

NATIONAL GAS RESERVES STUDY

The Federal Power Commission (FPC), acting through the National Gas Survey, will direct an independent estimation of proved recoverable reserves of natural gas of the United States. This estimation will deal with naturally occurring gas which analysis of geologic and engineering data demonstrates with reasonable certainty to be recoverable in the future from known oil and gas reservoirs under existing economic and operating conditions. The study will not include gas in storage.

Natural gas is defined to be a mixture of hydrocarbon compounds and small quantities of various non-hydrocarbons existing in gaseous phase or in solution with oil in natural underground reservoirs at reservoir conditions.

Reservoirs are considered proved that have demonstrated the ability to produce by either actual production or conclusive formation test.

Estimated gas reserves will be reported in cubic feet at 14.73 pounds per square inch absolute pressure and 60°F. temperature as of December 31, 1970.

All definitions and terminology will conform to that used by the American Gas Association (A.G.A.) Committee on Natural Gas Reserves as set forth in the report, "Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas in the United States and Canada and United States Productive Capacity as of December 31, 1970," and the American Petroleum Institute (API) Technical Reports Nos. 1 and 2.

I. FORMATION OF ORGANIZATION

To conduct the survey, independent experts will be employed or commissioned by the FPC and organized in four work disciplines.

A. *Gas field identification* will be provided by a comprehensive list of all gas fields in the United States. The list will assure that all fields with gas reserves are identified for survey. The Oil Information Center (OIC) at the University of Oklahoma Research Institute will be commissioned by the FPC and charged with this responsibility. Mr. Jack L. Morrison is the director of the Oil Information Center.

B. *Independent reserve teams* will be supervised by Mr. Lawrence R. Mangen, FPC Assistant Section Head of the Gas Supply Section. The teams are to be made up of geologists, engineers and other professional staff members of the Federal Power Commission to review data ordinarily needed to determine gas reserves, with assistance, as available, from the United States Geological Survey, United States Bureau of Mines, and from colleges and universities.

C. The *independent accounting* agent will be selected by the Federal Power Commission. This agent will be commissioned by the Federal Power Commission to:

1. Provide security for individual field reserve estimates;
2. Classify gas fields by reserve size and age; perform random selection of fields for reserve estimations as prescribed by the statistical validation team;
3. Consolidate the findings of the reserve teams; and
4. Report United States gas reserves estimates to the National Gas Survey.

D. A *statistical validation* team will be supervised by Dr. Marie D. Wann, Chief Mathematical Statistician, Statistical Policy Division, United States Office of Management and Budget. The team will consist of other experts from the Office of Management and Budget and others commissioned by the FPC. This team will have the responsibility of prescribing sampling procedures for valid reserve estimation.

E. Task Force Advisory Sections, which shall perform as work teams and not Industry Advisory Committees, will be selected from the membership of the Supply-Technical Advisory Task Force-Natural Gas Supply. These sections will perform the tasks assigned by the Supply-Technical Advisory Task Force-Natural Gas Supply as indicated in Attachment A (Items B, F, N, P, and W) and other tasks as assigned.

II. SECURITY CONSIDERATIONS

Individual companies must, for competitive reasons, protect highly confidential information in competitive areas such as offshore Louisiana. The security problem will be accommodated by:

A. Requiring that all company-furnished data be evaluated at the companies' offices with no data or worksheets leaving the premises. All independent reserve team generated worksheets will be preserved in the companies' offices until July 1, 1974.

B. Having the complete list of A.G.A. individual field reserve estimates available only to the independent accounting agent. All these reports are to be returned to the member of the A.G.A. Committee on Natural Gas Reserves assigned to the particular area involved as soon as the study is completed.

C. Having the A.G.A. reserve estimates for the randomly selected sample fields for independent reserve estimation available to Mr. Lawrence R. Mangen, supervisor of reserve teams.

III. DETAILED PROCEDURES

They are diagrammed on the information flow chart, Attachment A. Information boxes on the chart bear the same letter designation as the corresponding descriptive paragraphs which follow.

A. The National Gas Survey requests that the industry representatives who provide A.G.A. reserves also submit those reserves by fields on a confidential basis directly to the selected accounting agent.

B. A Natural Gas Supply Task Force Advisory Section (Item B, Attachment A) will recommend a data for recording U.S. gas fields and reserves. The format will be readily convertible to computer cards and will record the following information for each gas field:

1. A.G.A. District.
2. State.
3. Railroad Commission District or State Subdivision.
4. Field Name or Names.
5. Discovery Date.
6. Gas Reserves as of December 31, 1970.

C. A Task Force Advisory Section (Item B, Attachment A) will meet with the industry representatives and will explain the data format. A request will be made that each A.G.A. subcommittee chairman provides the indicated data on all gas fields in his area.

D. A computer card will be punched for each gas field. A computer program will be written for error checking and sorting as is needed.

E. A listing of all gas fields for which reserve data has been submitted will be prepared by the accounting agent and forwarded to the Oil Information Center (OIC) at the University of Oklahoma Research Institute. This list will provide the state, field name, and discovery date—but no reserve information.

F. The field list developed from the A.G.A. records will be compared by the OIC with a list from the United States Government Interagency Oil and Gas Field Study. The "government" data is presently stored by computer in a data bank at the OIC.

G. Screening and verification of the field lists will be done by the OIC. This operation will reconcile field names and identify duplications and omissions. Other information sources such as U.S. government publications, state geological survey publications, and oil and gas regulatory agency publications will be used, if necessary. A Task Force Advisory Section (Item F, Attachment A) of the Supply-Technical Advisory Task Force-Natural Gas Supply, will assist in clarifying field nomenclature.

H. The OIC will compile the complete list of gas fields in the United States. It will include all gas fields with remaining recoverable gas reserves as of December 31, 1970. The fields will be grouped by state and substate areas. The listing will be alphabetical and will convey field name and date of discovery.

I. A copy of the gas field identification list and a supplemental list of "A.G.A. omitted fields" will be forwarded by OIC to the accounting agent. National Gas Survey teams will later estimate reserves for any omitted field.

J. A copy of the gas field identification list will be forwarded to the National Gas Survey together with a statement of accuracy. Both documents will appear in the final reserves publication.

K. The independent accounting agent will stratify all fields in each A.G.A. subcommittee area by size and age so that a statistically valid sampling procedure can be prescribed.

L. The statistical validation team will prescribe the number of fields to be surveyed independently in each A.G.A. subcommittee area by size and age category in order to project a statistically valid reserve estimation with a reasonable degree of accuracy and certainty.

Sampling will be started on a minimum basis to test the magnitude of deviation. If, in the initial field reserve estimations, the standard deviation of the percentage differences from their mean is too large to assure the desired certainty and accuracy, additional sampling will be carried out as required or the specifications will be modified. The National Gas Survey will balance the time required against the desired accuracy so as to obtain the best results in a reasonable time.

M. The accounting agent will select the fields to be surveyed in each category as prescribed by the statistical validation team and will furnish a list of field names to the independent reserve team supervisor with a copy to the Task Force Advisory Section (Item N, Attachment A). The list of "A.G.A. omitted fields" will also be submitted for independent reserve estimations.

N. The Task Force Advisory Section (Item N, Attachment A) will assign each sample field to a company, and will schedule reserve team visits to the various companies. Valid results will require a company to furnish data for each randomly selected field.

O. Companies will prepare to furnish, if available:

1. A working area with telephone connections. Materials should include a calculator, adding machine, planimeter, and normal office work desks, tables, and equipment.

2. The type of information which may be requested of the companies for use during reserve team visits is listed for reference:

a. For each field: It will probably be necessary to supply the following items, if available:

(1) A map of the field area showing the location and completion of all wells drilled prior to December 31, 1970.

(2) Electrical well surveys to illustrate the depth and configuration of all gas-bearing reservoirs.

(3) Core analysis needed for basic rock properties.

(4) Reservoir production histories may be needed which tabulate oil, gas, condensate and water production for each gas reservoir on a yearly basis to December 31, 1970.

(5) Specific gravity of gas.

(6) Formation temperature.

(7) Original reservoir pressure.

b. For fields in which porosity-area reserve estimates have been made, the following additional information may be requested:

(1) Effective porosity—electric well surveys and core analysis.

(a) Porosity

(b) Salt water saturation

(2) Productive reservoir volume—copies of isopach maps should be available for examination Planimetered volumes should be available.

c. For fields in which pressure-volume reserve estimations have been made, the following additional information may be requested:

(1) A tabulated record of reservoir pressure measurement versus gas withdrawals.

(2) Backup data for each pressure measurement.

d. Questions on interpretive data, such as estimated recovery efficiency, may be furnished by companies, if requested by the reserve teams.

P. The National Gas Survey will provide an appropriate seminar for the independent reserve teams prior to beginning the field surveys. The seminar will be conducted by a team of qualified geologists; engineers and other qualified personnel selected from government agencies and/or colleges and universities. The seminar will be held at an early date for the purpose of assuring quality reserve estimations, the use of standard techniques, and definitions.

Q. Independent reserve estimations will be made in the offices of the various companies. Each company will furnish a qualified representative who is familiar with all the reserve data pertaining to the subject field. He will furnish these data to the reserve teams as needed and will insure that no data other than the independently derived field reserve are taken from the working area. He will be available to answer inquiries of the reserve teams but will not be a member of the team.

R. Independent reserve estimations are transmitted on a confidential basis to the reserve team supervisor. The reserve team supervisor will compare the independent field reserve estimates with reserve estimates from the A.G.A. He may compare them with any other source including (but not limited to) the following:

1. OIC Data Bank at the Oklahoma University Research Institute.
2. Natural Gas Companies' Annual Report of Gas Supply—FPC Form 15.
3. Industry professional publications.
4. United States Geological Survey data.

At his discretion, he may call for a recheck of the work of the first reserve team or he may call for a re-examination of the data by a "senior reserve team" of his choice. A final reserve estimate for each field will be transmitted to the accounting agent.

S. When the accounting agent has received all final reserve estimates, he determines the deviation from the mean of the sample. He forwards the deviation information to the statistical validation team.

T. The statistical validation team determines the adequacy of the sample. Additional sampling will be prescribed if it is required to obtain the desired accuracy and certainty.

U. The accounting agent will randomly select the additional fields. Additional reserve estimations will be made by the reserve teams in accordance with the original procedure, and the results will be compiled and examined as before.

V. When sampling is sufficient to assure the desired accuracy, the statistical validation team reports to the National Gas Survey. The report will include a description of the sampling procedure and a statement of the reliability of the survey.

W. One independent reserve team will have the responsibility of compiling and reporting United States dissolved gas reserve statistics as needed. The Task Force Advisory Section for dissolved gas (Item W, Attachment A) will furnish historical data.

X. The accounting agent submits a report to the National Gas Survey on United States gas reserves as of December 31, 1970. When the report is accepted by the National Gas Survey, the accounting agent will dispose of all records which reflect gas reserves by field in the manner prescribed in paragraph II–B

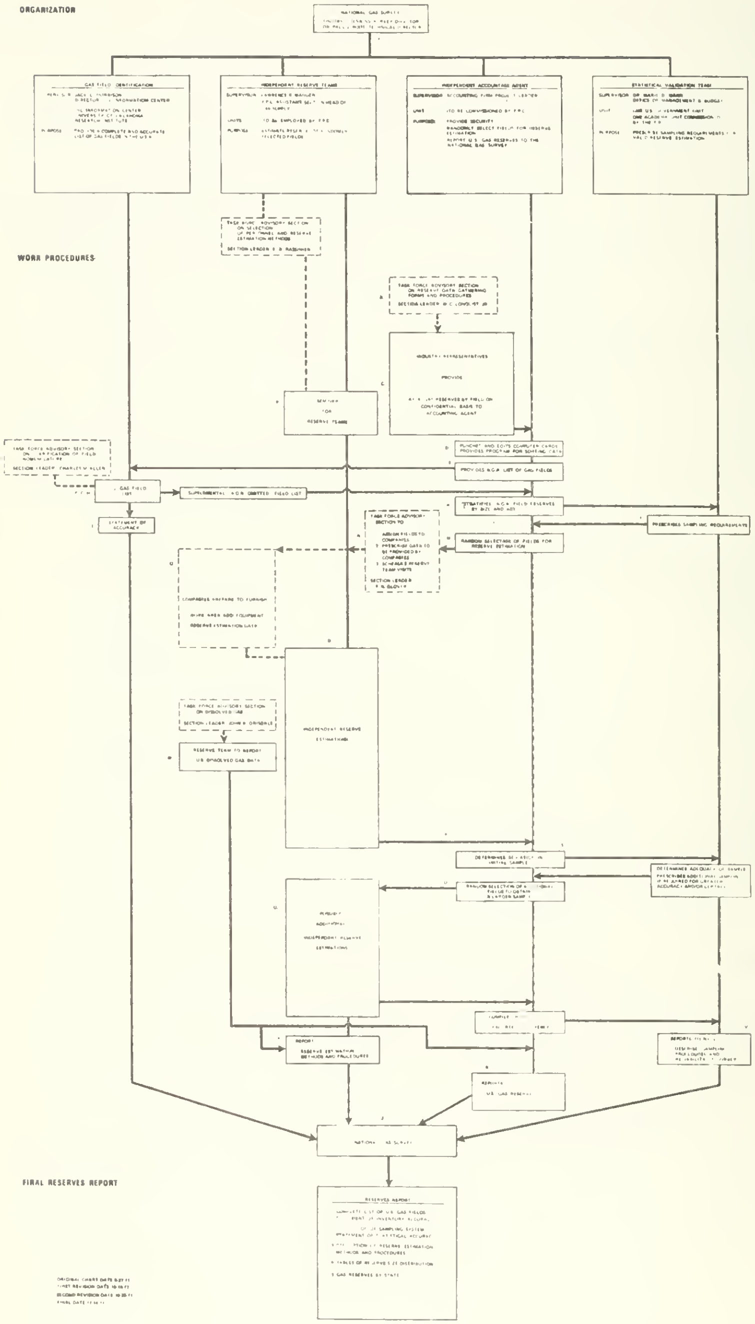
Y. The reserve team supervisor will submit a detailed summary of the methods and procedures used to make the independent reserve estimations. He will receive assistance from the personnel conducting the Reserves Seminar and will be advised by the Task Force Section on reserve determinations methods (Item P, Attachment A). The reserve team supervisor will return all A.G.A. records which reflect gas reserves by field to the member of the A.G.A. Committee on Natural Gas Reserves assigned to the particular area involved when the accounting agent's report is accepted.

Z. The National Gas Survey will publish its initial reserves report in the following form:

1. Complete list of gas fields in the United States by states and substate areas with year of discovery. A statement of accuracy by the Director of the Oil Information Center, University of Oklahoma Research Institute.
2. Detailed description of sampling procedures. A statement of statistical accuracy by the leader of the statistical validation team.
3. Detailed description of methods and procedures of reserve determination by the reserve team supervisor.
4. Report of reserves from the accounting agent. Report will include:
    - a. Gas field size distribution.
    - b. Gas reserves by states.
5. Recommendations relating to future estimations of national gas reserves

ATTACHMENT A

NATIONAL GAS RESERVES STUDY


ORGANIZATION
NATIONAL GAS SURVEY
GAS FIELD IDENTIFICATION
INDEPENDENT RESERVE TEAMS
INDEPENDENT ACCOUNTING AGENT
STATISTICAL VALIDATION TEAM
WORK PROCEDURES
INDUSTRY REPRESENTATIVES
PROVIDE
SEMINAR FOR RESERVE TEAMS
INDEPENDENT RESERVE ESTIMATION
PRESCRIBES SAMPLING REQUIREMENTS
RESERVE TEAM TO REPORT U.S. DISSOLVED GAS DATA
NATIONAL GAS SURVEY
FINAL RESERVES REPORT
RESERVES REPORT

Enclosure 2

UNITED STATES OF AMERICA, FEDERAL POWER COMMISSION

Before Commissioners: John N. Nassikas, *Chairman;* John A. Carver, Jr., Albert B. Brooke, Jr., Pinkney Walker, and Rush Moody, Jr.

ORDER AMENDING ORDER PROSCRIBING PROCEDURES FOR THE NATURAL GAS SURVEY

(Issued March 9, 1972)

By order issued December 21, 1971, the Commission directed that a study and analysis of natural gas reserves be conducted and prescribed procedures for its undertaking. In ordering paragraph (C) of that order, the Commission noted that the procedures therein specified did not preclude the undertaking of such other procedures therein specified did not preclude the undertaking of such other procedures or reserves studies or the obtaining of such further information or data relating to gas supply as may be determined by the Commission or Staff to be necessary or appropriate in carrying out the Commission's National Gas Survey to serve the public interest.

The procedures set forth in that order established independent reserve teams, to be made up of geologists, engineers and other professional staff members of the Federal Power Commission to review data ordinarily needed to determine gas reserves, with asistance, as available, from the United States Geological Survey, United States Bureau of Mines, and from colleges and universities. These independent reserve teams would make independent reserve estimations of selected natural gas fields in the offices of the various companies, transmitting those estimations on a confidential basis to the reserve team supervisor.

The Commission reiterates the need for protecting the confidentiality of properietary information. The Commission recognizes that the publicizing of such information would have an inhibiting effect upon future exploration for natural gas reserves since speculators could equally benefit with those companies willing to make geological and geophysical expenditures. Therefore, the Commission reaffirms ordering paragraph (B) of its December 21, order which reads as follows:

"Any non-public commercial information concerning an individual natural gas company's reserves obtained during the course of this survey and analysis shall be treated as confidential without public disclosure by the staff of the Commission and its agents, including any accounting firm selected by the Commission to assist in this survey and analysis, unless otherwise directed by the Commission. The provisions of Section 8(b) of the Natural Gas Act [15 U.S.C. 717g(b)] and 5 U.S.C. 552(b)(4) and (9) [Freedom of Information Act] shall apply."

Among the security considerations prescribed to preserve that confidentiality, the Commission required in its order that all company-furnished data be evaluated at the companies' offices with no data or worksheets leaving the premises. Worksheets generated by independent reserve teams were to be preserved in the companies' offices until July 1, 1974. Upon reconsideration, we believe that the confidentiality of such worksheets as are prepared by independent reserve teams may be better protected if those worksheets are returned to the Commission's offices in Washington, D.C. to the custody of the Technical Director of the National Gas Survey, who shall take all steps necessary for protecting the security of these worksheets.

The Commission finds:

The objectives of the National Gas Survey will be served by maintaining the worksheets generated by the independent reserve teams in a central repository, properly secured.

It is in the public interest that such worksheets be retained by the Commission, subject to further order.

The Commission orders:

(A) The procedures approved in Paragraph II A of Appendix A to the "Order Directing Study and Analysis of Natural Gas Reserves and Prescribing Procedures for the National Gas Surevy" (December 21, 1971) is hereby amended in accordance with Paragraphs B and C, *infra.*

(B) Worksheets generated by the independent reserve teams in the course of their independent reserve estimations shall be returned to the Commission's Washington, D.C., offices and there preserved in the custody of the Technical Director of the National Gas Survey, subject to further order.

(C) The confidentiality of these worksheets shall be maintained without public disclosure pursuant to the provisions of Section 8(b) of the Natural Gas Act [15 U.S.C. 717g(b)] and 5 U.S.C. 552(b)(4) and (9) [Freedom of Information Act], subject to further order.

By the Commission.

KENNETH F. PLUMB, *Secretary.*

[SEAL]

U.S. SENATE,
COMMITTEE ON THE JUDICIARY,
SUBCOMMITTEE ON ANTITRUST AND MONOPOLY,
Washington, D.C., March 7, 1973.

Hon. JOHN N. NASSIKAS,
Chairman,
Federal Power Commission,
Washington, D.C.

DEAR MR. CHAIRMAN: The February 22, 1973, release of the Federal Power Commission (No. 19013) reports that total uncommitted natural gas reserves available for sale in the lower 48 states "as reported by 79 large gas producers declined from 4.6 trillion cubic feet at the end of 1969 to 3.4 trillion cubic feet by mid-1972"—a decline of 26 percent. The release indicates that the aggregate figures were compiled from individual company responses pursuant to FPC order.

Congress is deeply concerned about the present unavailability of natural gas and has been conducting continuing hearings on its causes and extent. At my request, the Federal Trade Commission also commenced an investigation of the reliability of natural gas reserve data. I understand that the Commission's effort to obtain internal company reserve data has been frustrated by the refusal of the major producers to comply with Commission process.

The fact that the Federal Power Commission has obtained important information, heretofore unavailable to the Congress and the FTC, could represent a significant breakthrough in the quest for reliable and verifiable natural gas reserve estimates. Would you, therefore, kindly provide the Federal Trade Commission and myself with the following:

1. The questionnaire or other request for information sent to the 79 producers.
2. A description of the procedure used to verify the data supplied by the producers.
3. An estimate of the proportion of domestic natural gas reserves available for sale controlled by the 79 producers.
4. An analysis of the 26 percent decline in reserves showing the amount of decline resulting from sales and from write-downs and other adjustments on an aggregate basis and for each of the 79 producers.
5. For each producer, identify its pipeline customers and the amounts and prices of gas sold for the 1970-mid-1972 period.
6. With regard to the 3.4 trillion cubic feet of natural gas available for sale in mid-1972, specify the uncommitted reserves reported for each of the 79 producers.

Your prompt attention to this matter will be appreciated.

Sincerely,

PHILIP A. HART, *Chairman.*

Senator KENNEDY. You have some of the other commissioners here; I didn't know whether there was anything they would like to mention, any agreement or disagreement with some of the points raised here.

Mr. MOODY. Senator, we have a very articulate and able chairman. I think we agree basically with most of what he said today.

Mr. BROOKE. I would concur in that statement.

Mr. NASSIKAS. I stated earlier that Commissioner Springer has only been a commissioner for 5 or 6 days, so he decided he really couldn't contribute to this hearing and apologizes to the committee for not being here. He is in Scotland—at least should be tomorrow night.

Senator KENNEDY. Are you familiar with Mr. Diener?

Mr. Nassikas. He is my top administrative assistant.

Senator Kennedy. You made some recommendations about this study, when you were with the FTC.

Mr. Diener. Senator Kennedy, I don't recall. I was involved somewhat before I left the employ of the FTC.

Senator Kennedy. On the AGA reserves?

Mr. Diener. I can't recall; it was 2 or 3 years ago.

Senator Kennedy. You don't recall recommending the closing of the file on that?

Mr. Diener. I do not recall. I could have written a memorandum to that effect. If there is such a memorandum, I would like to take a look at it.

Senator Kennedy. If there is a memorandum of yours, and if you did make that recommendation, do you feel any kind of restraint about being involved in the case over at the Federal Power Commission?

Mr. Diener. Involved in what case over at the Federal Power Commission?

Senator Kennedy. In the decisions affecting natural gas.

Mr. Diener. I am not involved in any decisions. I am just counsel. I don't have any votes.

Senator Kennedy. You wouldn't feel any kind of restraint? Is that your document?

Mr. Diener. This is my recommendation [referring to the memo]. I recall it now.

Senator Kennedy. This will be made a part of the record.

Mr. Diener. This says close the files because of insufficient evidence without prejudice at that time.

Senator Kennedy. What was the Commission's action on that recommendation?

Mr. Diener. I can only surmise; it is still going on. This was written to my supervisor not to the Commission. I don't know what the Commission did afterward.

Senator Kennedy. You are still serving and counseling the Commission on this particular matter, as the Power Commission——

Mr. Diener. We have no investigation in the FPC of the AGA subcommittee in south Louisiana. I think that after the contents of this letter are read, when you put it in the time frame——

Senator Kennedy. If you want to submit any supplementary or explanatory material, it will be received.

Mr. Diener. As long as this is in the record, in toto. I have nothing more to say with respect to the memorandum.

[The memo referred to plus an explanatory supplemental response from Mr. Diener follows. Testimony resumes on p. 137.]

Memorandum

To: Owen Johnson, Assistant Director, Bureau of Competition.
From: William P. Diener, Attorney, Bureau of Competition.
Subject: American Gas Association, Inc. File No. 7110042.
Recommendation: Close File No. 711 0042, without prejudice, for lack of evidence of collusion among members of the AGA South Louisiana Area Subcommittee.

On October 5, 1970, the Bureau of Competition was charged with conducting a selective "pilot" investigation of the AGA South Louisiana Area Subcommittee. The Office of Planning and Evaluation's memoranda of October 5 and October 13, set definite boundaries for this investigation: collusion among members of the AGA South Louisiana Area Subcommittee in determining natural gas reserves and a possible violation of Section 5 of the F.T.C. Act. Concurrent with the AGA investigation, two related matters were given high priority; 1) the energy position of the concentrated industry study, and 2) mergers in the energy field.

The pilot AGA investigation was originally planned to reach a point at which a decision could be made either to expand the investigation or close the files. As a result of the investigation to date, and in lieu of the responses to our outstanding letter of December 24 to John C. Jacobs, Jr. of the AGA, it is my *presonal* belief that the file should be closed. *My* evaluation of the evidence gathered to-date indicates an absence of any collusion at the AGA Subcommittee level. *I therefore recommend closing File No. 711 0042.*

PARTIAL SUMMARY OF INVESTIGATION

National Economic Research Associates, Inc: Messrs. Bass and Netschert deny the existence of a natural gas shortage. Instead, they attribute a major share of the current "crisis" to an overly-conservative AGA definition of "proved reserves." They cited one example of acreage in Offshore Louisiana which was not included in "proved reserves." This gas may well be included in other reserve estimates (e.g. possible, probable, speculative), because they were not recoverable under "existing economic and operating conditions."

United States Geological Surey: Mr. Speer indicated a producer would be economically "stupid" to withhold gas from the market; moreover; he is unaware of any instance where this has occurred.

Federal Power Commission: The issue of AGA determinations of gas reserves is presently being litigated in AR69–1 (Note: Office of Planning and Evaluation questions whether or not, in fact, this issue will be litigated). Moreover, two submissions of evidence in AR69–1 are germane to our case:

1. Arthur Young & Co. audited uncommitted reserves in South Louisiana and found no withholding. (May 18, 1970)
2. Over 90% of the shut-in gas completions as of December 31, 1969, had been committed to contract. (April 1, 1970.)

Finally, the FPC checked with USGS and the Louisiana Department of Conservation, thereby concluding there were no discovery gas wells with unreported uncommitted reserves.

Antitrust and Monopoly Subcommittee, U.S. Senate. This subcommittee, from which Senator Hart's allegations contained in his letter of September 1 were initiated, was, and continues to be, without any evidence of collusive activity.

ANALYSIS

Numerous allegations have arisen due to the current "energy crisis." These assertions cover a wide range of fossil fuels in the oil companies to higher consumer utility rates. The major petroleum companies do control the supplies of natural gas. The natural gas producers may be intentionally withholding gas awaiting a higher price. The alleged gas shortage may be due to conservative AGA definitions. However, assuming any one or all of these allegations are correct, I believe they are outside the scope of our investigation.

The decline in gas reserves may be a result of our current economic situation. Corporations may be reducing "inventories" to more manageable levels, with a resultant decline in the reserve-to-production ratio of natural gas. An artificial demand for gas may have been created due to the FPC's rate posture. The demand for oil has grown at a rate half that of gas, yet exploratory effort for the two is often related.

Even assuming producers are sitting on gas reserves, Interior has authority to cancel leases or accelerate exploration activity in the offshore areas. The Louisiana Department of Conservation has comparable authority in the onshore areas.

It is this writer's belief that it would be a mistake to proceed further without either expanding the scope of this investgiation or closing the present one. I question our expertise to go further. Moreover, I feel the numerous allegations can be considered through our merger study or energy study, with a more effective utilization of our limited resources.

Respectfully submitted,

William P. Diener,
Attorney, Bureau of Competition.

FEDERAL POWER COMMISSION,
Washington, D.C., July 11, 1973.

Hon. PHILIP A. HART,
Chairman, Subcommittee on Antitrust and Monopoly, Committee on the Judiciary, Washington, D.C.

DEAR MR. CHAIRMAN: This letter represents my supplemental response to the hearings before your Subcommittee on June 26, 1973, in which Senator Kennedy produced a memorandum authored by me, but undated, from an investigatory file while I was employed at the Federal Trade Commission. (Transcript at 170). This response neither denounces nor expands the subject memorandum, nor has my response been approved by the Federal Power Commission. My response is precipitated because of Senator Kennedy's questions at Transcript pp. 169–170. Please be advised that the subject memorandum written by me while in the employ of the Federal Trade Commission in no way conflicts with the discharge of my responsibilities as administrative law assistant to the Chairman of the Federal Power Commission.

On June 14, 1970, I entered government service as a Trial Attorney in the Bureau of Competition of the Federal Trade Commission. On April 11, 1971, I resigned from the FTC to accept a position as Trial Attorney at the Federal Power Commission. I was appointed Attorney-Adviser to the Chairman of the Federal Power Commission on January 23, 1972; a position which I continue to occupy.

The subject memorandum, which was undated, was drafted sometime during the period October 5, 1970 (the date the investigation was initiated) to April 11, 1971, and is addressed to Owen Johnson, then an Assistant Director of the FTC's Bureau of Competition. As the memorandum indicates, the scope of the investigation was to determine if there was "collusion among members of the AGA South Louisiana Area Subcommittee in determining natural gas reserves and a possible violation of Section 5 of the F.T.C. Act." I recommended closing the investigation, without prejudice, because "[m]y evaluation of the evidence gathered to date indicates an absence of any collusion at the AGA Subcommittee level."

At pages 2–3, I summarized some of the evidence obtained during this initial pilot investigation, including *inter alia* reference to Senator Hart's allegations to which I indicated were "without any evidence of collusive activity." In addition to the lack of evidence concerning the circumscribed inquiry of this initial investigation, I also indicated the FTC may not possess the "expertise to go further" and that the "numerous allegations can be considered through our merger study or energy study, with a more effective utilization of our limited resources."

I am unaware as to what action Mr. Johnson took with respect to my recommendation. I am also unaware as to whether or not the Federal Trade Commission received such a memorandum or any subsequent action they may or may not have taken with respect to American Gas Association, Inc., File No. 711–0042. Inquiries concerning the present status and scope of that investigatory file should be directed to the FTC.

In summary, there does not now exist, nor has there in the past existed, any conflict of interest between a recommendation made by me in an intra-agency memorandum while in the employ of the Federal Trade Commission and the discharge of my responsibilities at the Federal Power Commission, either as trial attorney or as attorney-adviser to the Chairman. I have adhered to both the spirit and the letter of the canon of legal ethics, as well as the standards of ethical conduct for government employees contained in Executive Order No. 11222. I view such standards as a minimum and have always, in my government service, imposed more demanding and exacting standards on my own conduct.

I have returned herein the copy of the intra-agency subject memorandum which your staff forwarded to me so that I could file this supplemental response.

Sincerely,

WILLIAM P. DIENER.

Mr. NASSIKAS. A copy of this memorandum, Mr. Chairman, I assume will be supplied by the staff to me so I can review it?

Senator KENNEDY. Yes.

We will have to recess now. We thank you very much for coming. We will go to the next witness after the recess.

[A brief recess was taken.]

[The following letter, relating to Dr. Root's testimony, was received for the record. Testimony resumes on p. 154.]

FEDERAL POWER COMMISSION,
Washington, D.C., July 27, 1973.

Hon. PHILIP A. HART,
U.S. Senate,
Washington, D.C.

DEAR SENATOR HART: This letter is being sent to the committee for inclusion in the Record of the Hearings held before the Subcommittee on Antitrust and Monopoly of the Committee on the Judiciary on July 26–28, 1973. It is intended to serve two purposes. First, it will provide information which I indicated during my testimony would be transmitted for the record at a later date. Second, it will clarify and respond to statements, which I consider to be incorrect or misleading, made during the course of the hearing concerning the National Gas Reserves Study.

Additional information is presented to complete my responses to two questions asked by Mr. Bangert. The questions and responses are as follows:

Question 1. "What was your sampling percentage there [the fields with reported reserves of less than 400 Bcf.]"

Answer. The procedures followed by the Statistical Validation Team, the characteristics of the sample, the statistical analysis used and the results obtained are presented in The Report of the Statistical Validation Team which is Appendix VI of the National Gas Reserves Study. Exhibit A indicates for the record the members of the Statistical Validation Team. A brief excerpt from the Summary of the report will be used as the vehicle for conveniently and completely conveying the information requested.

On the basis of a population list of 6,358 gas fields and their estimated reserves developed both from data supplied by the American Gas Association (A.G.A.) and from public sources, the Statistical Validation Team chose a standard sampling procedure which is widely used in situations similar to this study. The sample was composed of all 108 fields on the population list with reserves reported to be greater than 400 billion cubic feet (Bcf), and 50 fields selected from the remainder of the population fields whose reserves were reported to be equal to or less than 400 Bcf. [The respective sampling percentages were 100% and 0.8%.] Independent estimates of gas reserves for the designated sample fields were made by field teams composed of government and university experts. The Statistical Validation Team formulated the method for estimating the total U.S. gas reserves from the independent reserves estimates for the sample fields. As a result of the analysis, the total U.S. reserves of non-associated and associated gas for the fields comprising the population list were estimated to be 228.5 trillion cubic feet (Tcf) at the end of 1970 (Table 1). The standard error of the estimate due to sampling was 11.0 Tcf. Reserves in the 158 sample fields represented approximately 56 percent of this total reserves estimate.

The standard error of the total reserves estimates is a statistical measure of the reliability of that estimate. Additional sampling would reduce the standard error and, therefore, improve the statistical accuracy of the estimate. It is the judgment of the Statistical Validation Team, however, that additional sampling would have little practical effect on the reliability of this estimate of total reserves because of the problem of measurement error. That is to say, even if an independent estimate of gas reserves had been made for each field in the population, the value of total reserves determined would only be an estimate of the "true" value because of judgment inherent in estimating the reserves of individual gas fields.

Question 2. "Did you find discrepancies greater than 200% between the A.G.A. reserves and your estimates in the 50 fields?"

Answer. It is extremely misleading to refer to percentage discrepancies, because doing so implies that one of the two estimates is considered to be the true value. The number and nature of the judgmental decisions required in making a reserves estimate precludes the designation of a true or exact value. It is a practical reality that knowledgeable and competent experts given the same basic data might arrive at considerably different values for the reserves in a given field. It is also true that the proven reserves of a field can only be stated with exactness when the field has been depleted.

To avoid the difficulties inherent in specifying the true value of the reserves of a field, comparisons within the NGRS have been expressed on the basis of the ratio of the estimate made by the independent field reserves team (FPC estimate) to that reported by A.G.A. (A.G.A. estimate). For the 50 field module four ratios greater than 2 were obtained and the pertinent information regarding them can be summarized below:

Stratum from which the field was selected (Bcf)	*Ratio*
0–1	8.83
0–1	3.03
10–50	4.32
50–200	2.11

Expressing the differences as a percentage of the A.G.A. value, only the first three of the above ratios would yield percentage differences greater than 200% and all three are confined to strata containing very small fields.

On the other hand an alternative convention could have been adopted in which the ratio of the A.G.A. estimate to the FPC estimate would be used and percentage differences would be expressed as a percentage of the FPC estimate. On the basis of this convention, 18 of the ratios for the fields in the module of 50 would be greater than two and 14 of the percentage differences would be greater than 200%. Actually, two of the percentage differences would be infinite, *i.e.*, the independent field reserves teams found that two of the fields in the module of 50 for which the A.G.A. carried reserves were, in fact, depleted.[1]

A consideration of the results of the analysis of the 108 major fields is also instructive. There are no instances in which the FPC estimate is over twice the A.G.A. estimate. However, there are 12[2] instances in which the A.G.A. estimate was over twice the FPC estimate, and 7 of them had percentage differences (expressed as a percentage of the FPC estimate) greater than 200%.

Essentially, the first convention focuses on differences in which the FPC estimate is greater than the A.G.A. estimate (A.G.A. underestimates) and the second on those in which the A.G.A. estimate exceeds the FPC estimate (A.G.A. overestimates). Without recourse to formal statistical analysis, the fact that the A.G.A. overestimates as defined above exceed the A.G.A. underestimates by a factor of a greater than four would, in itself, lend strong support to any contention that the A.G.A. proven reserves total is an overestimation.

Finally, it should be noted that comparisons of the A.G.A. estimates and the FPC estimates are not relevant to the discussion of the validity of the statistical sampling and analysis techniques used in the NGRS to obtain the overall reserves estimate. The A.G.A. estimates were only used to define the statistical population so that a frequency distribution could be expressed for sampling purposes. It is true that distortions in the population would be manifest in the frequency distribution, and that they would affect the reliability of the estimate; however, they would have relatively little effect on the projected total reserves, The standard error, a statistical measure of the reliability of the projected total reserves takes into account variability of measurements within strata, and it was used by the Statistical Validation Team to assess the adequacy of the sample.

In regard to the testimony of Mr. Halverson, I would like to make several observations. First, and perhaps most important, the statements made by Mr. Halverson are unsupported by documentation and are meaningless unless a definition of reserves is stated and all reserves estimates cited are consistent with the definitions. Indeed most of Mr. Halverson's dilemma appears to be definitional in nature. If the definition of reserves is really the issue, then it should be addressed directly. In the National Gas Reserves Study the definition of reserves used throughout the study is stated clearly and explicitly in the report so that ambiguity does not cloud the presentation of the results. The definition is as follows:

The reserves . . . are natural gas . . . reserves estimated to be recoverable from proved reservoirs under the economic and operating conditions existing at the time of the estimate. Such volumes of gas . . . are expressed in cubic feet at 14.73 pounds per square inch absolute pressure and 60° F temperature.

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[1] This serves as a further indication that as stated in the *National Gas Reserves* Study there "is a strong justification for continuous monitoring of reserves".

[2] This differs from the corresponding figure of 11 shown in Exhibit 3 of the testimony of Dr. Howard William Pifer III which does not include one field mistakenly classified on the A.G.A. major field list as an associated gas field but which was found on subsequent investigation to contain only dissolved gas.

These reserves estimates . . . include gas . . . reserves of all types regardless of size, availability of market, ultimate disposition or use.

The field teams were further instructed to make the following assumptions relating to economic and operating conditions:

1. A ready market will exist for all volumes of gas produced.
2. If sold in interstate commerce, sales price for gas will be at the effective rate as of December 31, 1970 (or at FPC ceiling if the gas is not under contract) with no allowance for price escalations beyond those already approved in FPC area rate orders . . .
3. Everything will be frozen at 1970 levels; i.e., prices, wages, etc.
4. Environmental effects will not restrict gas recovery.
5. Nuclear stimulation is not an economic method of gas recovery at present.
6. Compression will be installed if and when economically justified.
7. The recovery factor will differ significantly for water drive reservoirs, fractured reservoirs, exceptionally high pressure reservoirs, low permeability reservoirs and associated gas reservoirs, for example. The estimator will not limit his consideration to the "prevailing practice" in the field, but rather should consider the possibility of adding compressors or other equipment and base his estimate on the recovery efficiency which would result from installation of such equipment, if he felt it appropriate to install the equipment.

Second, Mr. Halverson makes the statement that "It is our experience that the raw data necessary in order to make original estimates of natural gas reserves cannot be obtained outside of company sources and that when the Federal Power Commission relies solely on the company (without independent audit) and to provide all the raw data, that reliance is misplaced." I wish to emphasize again that the FPC field reserves teams did, in fact, make an independent estimation of the reserves for all fields comprising the statistical sample The field team leaders are either trained geologists or petroleum engineers who have had extensive experience in making reserves estimates as part of their duties with the Federal Power Commission. They know what basic data are required and because of their extensive experience they can anticipate the types of data which would normally be available under various circumstances. The procedures used by the field reserves teams are given in detail in the *Reserves Estimation Manual* included in Appendix IV of the National Gas Reserves Study. In addition to brief description of their activities is given in the Summary of the report as follows:

When the reserves teams analyzed an individual filed, their estimate was developed on a reservoir-by-reservoir basis. The teams estimated the reserves for each reservoir in the field and summed the reserves of all reservoirs to obtain the field reserves estimate. Estimates were developed from the basic raw data which were supplied by the company. These data usually consisted of various types of electrical, radioactive and accoustical well logs; core analyses; fluid analyses, open hole, production, back pressure, draw down and build-up, and other type well test; temperature measurements; gas analyses; structural and isopachous maps; and pressure and production history. The basic data were reviewed to determine their adequacy, accuracy, and validity. The independent reserves teams utilized this information, and by applying accepted geological and engineering methods, made their own independent estimates of rserves. Rather than rely solely upon the various factors developed by the company, the teams derived their own factors for measurable physical properties such as porosity, water saturation, temperature, and pressure. Additionally, they were required to exercise their professional judgment in the interpretation of structural and isopachous maps and records, and the selection of appropriate abandonment pressures, recovery factors and similar factors affecting the volumes of reserves which would be recoverable.

As noted by Mr. Halverson in his criticism of the reporting procedures used by A.G.A., "Even this review [of the reserves estimates compiled for the fields] is limited in the sense that Subcommittee members only see the final estimate for a particular field and they do not see the underlying data." To overcome this very deficiency the NGRS was designed so that the field reserve teams could see *and analyze* the underlying data. Perhaps an equally significant implication of Mr. Halverson's criticism is that it applies with the same force to the procedures apparently being used by the staff of the Federal Trade Commission. As he has stated, "The [FTC] investigation was not attempting to make original estimates of proved reserves in South Louisiana but was instead attempting to obtain reserve estimates already prepared." If acceptance of reserves estimates without review of the underlying data is considered to be a questionable step in the A.G.A. reporting procedure, it must be considered to be an equally questionable step in the FTC investigation. The reserves estimates obtained from the companies are based on the same primary raw data analyzed by the field reserves teams in the NGRS. However, a more serious consideration and perhaps even a critical infirmity in the FTC investigation is that the judgmental decisions made by industry personnel who prepared the reserves estimates have been untested or unchallenged. The FTC investigation might be characterized as one involving the processing of "paper reserves," whereas the NGRS is based on independent estimates of proven reserves actually in the ground at a certain point in time.

Finally, the definitions and procedures used and the results obtained in the NGRS are a matter of public record. Any interested individual can judge them on the basis of professional quality, procedural correctness and thoroughness of the study. Until the FTC investigation has been subjected to the same public scrutiny, evaluation of the investigation should be withheld.

It is not my intention to offer a detailed point-by-point critique of Dr. Pifer's testimony. Instead I would like to indicate in general, the areas of his testimony which I consider to be inaccurate, incorrect or misleading. I should welcome the opportunity of presenting a more detailed analysis for the record if the Committee feels that would be helpful.

As background to my comments on Dr. Pifer's prepared statement and his response to questioning at the hearing, several factors should be stated which will serve to place the remainder of my remarks in proper perspective. It should be emphasized that Dr. Pifer was asked to serve as a member of the Statistical Validation Team because of his background in the application of statistics. In his capacity as a member of the Statistical Validation Team he was acting as an agent of the Federal Power Commission as set forth in Purchase Order No. 1067 (Exhibit B) which constituted the contractual agreement between Dr. Pifer and the Federal Power Commission. The conditions of the contract clearly indicate that the scope of Dr. Pifer's participation in the National Gas Reserves Study was limited to the activities of the Statistical Validation Team. The Commission's Order of December 21, 1971, which established the NGRS described the responsibility of the Statistical Validation Team as that of "prescribing sampling procedures for valid reserve estimation."

Dr. Pifer's services were not obtained on the basis that he was knowledgeable on the subject of the estimation of natural gas reserves and there is nothing in his credentials to indicate that he is an expert in this area. Other technical experts with the required training and experience to be able to provide authoritative opinions relative to the estimation of natural gas reserves were used in the study as appropriate. In particular the following four individuals, expert in various aspects of reserves estimation, taught courses which made up part of the training program for reserves teams members:

Prof. Elmer E. Templeton, Head, Department of Petroleum Engineering, Marietta College; Dr. R. G. Hamilton, well-logging consultant, Tulsa, Oklahoma; Dr. Abdul-Kader M. Kotb, Chairman, Department of Petroleum Engineering, West Virginia University; Dr. Kenneth K. Landes, Professor of Geology Emeritus, University of Michigan.

The following academic personnel participated in the evaluation of the field team work and procedures: Dr. Murray F. Hawkins, Head, Petroleum Engineering Department, Louisiana State University; Dr. Frank B. Conselman, Director, International Center for Arid and Semi-Arid Land Studies, Texas Tech University and past President of The American Association of Petroleum Geologists; Dr. Wilfred R. McLeod, Assistant Professor of Petroleum Engineering, Montana College of Mineral Science and Technology.

In addition Prof. Templeton was asked to prepare a report on Dissolved Gas Reserves which appears as Appendix VII of the National Gas Reserves Study.

There are several very important reasons that the terms of the contractual agreement should be considered. First, there apparently has been some misinterpretation of the role intended for Dr. Pifer in the National Gas Reserves Study as defined in his contract. Second, Dr. Pifer has testified relative to functions of the National Gas Reserves Study which were outside the scope of the contract and, in my opinion, beyond his area of expertise.

In his prepared statement Dr. Pifer has expressed concern about the reserves teams estimation of reserves. In the early stages of the NGRS, there was some uncertainty as to the exact manner in which the field reserves teams should perform the task assigned to them in the Commission's Order of December 21, 1971. For that reason I personally served as a field team leader on one of the very early field trips so that I might be in a better position to discharge my responsibilities in the National Gas Reserves Study. In particular, I wanted to be in a position to be able to make constructive recommendations about the procedures to be followed by the field reserves teams and to ascertain, in my own mind, the time required to obtain independent, reliable reserves estimates under actual study conditions. The results of my experience, those of other field team leaders and the experience and background of other Staff members, are all reflected in the Reserves Estimation Manual. As a result of having served as a field team leader, it is my strong judgment that the Reserves Estimation Manual has provided guidelines which would enable the field teams to make valid gas reserves estimations.

In addition, three qualified academicians were asked to evaluate the work being performed by the field teams. Their evaluations, included as Exhibits C, D, E and F, reinforce my opinion that field reserves teams did obtain independent and reliable reserves estimates. It is noteworthy that eight field team leaders were responsible for nearly all of the field reserves estimates and that the professional quality of the work of each of these eight men was evaluated on at least one occasion. Similarly the worked performed by the U.S.G.S. and the U.S. Navy teams was coordinated so that all reserves estimates would be made on the same basis.

Before leaving the subject of reserves estimates, the descriptions of in-depth and evaluation estimates given by Dr. Pifer are not consistent with those given in the Reserves Estimation Manual. The definitive text pertaining to the type of estimate to be used is as follows:

. . . Further, these limitations make it necessary to use two types of estimates, an "In-Depth Estimate" or an "Evaluation Estimate".

Either method is acceptable for the Independent Reserve Study. The method chosen depends on the judgment of the estimators:

1. In-Depth Estimate—the reserves for a reservoir have been estimated by recalculating or obtaining each needed factor from the basic raw data, such as core analyses, logs, pressure determinations, etc. The basic raw data have also been tested to assure its reliability and representativeness.

2. Evaluation Estimate—enough of the factors used to calculate reserves have been checked to assure, in the judgment of the evaluator, that the estimating factors used by the company are reasonable and acceptable for calculating the reserves. However, if any significant errors are found for any one or more particular factors, they would be recalculated from basic data. The basic raw data are tested as in 1., herein.

There was no support among the other eleven members of the Statistical Validation Team for presentation of results from the regression model recommended by Dr. Pifer. Dr. Miesch in his letter of February 7, 1973, (Exhibit G) discussed his concern about the application of this technique. At a meeting of the Statistical Validation Team on February 27, 1973, which Dr. Pifer was unable to attend, the use of the regression model was rejected as a tool for the statistical analysis of the data for the sample of gas fields. The following paragraph in the report of the Statistical Validation Team relating to the meeting of November 30, 1972 which was attended by Dr. Pifer, should be cited because it accurately demonstrates that the Team devoted considerable deliberation to this point before reaching its ultimate decision.

On November 30, 1972, the Statistical Validation Team met to review tabulations showing characteristics of the sample, to discuss the methods to be used subsequently in analyzing the results of the Study and to discuss the organization of the Team's report. There was considerable sentiment that the statistical analysis presented in the Team's report should be based on conventional methods for estimating population properties from the sample statistics. However, it was felt that an alternative approach, based on regression analysis, should be presented in a separate report because it could potentially portray differences attributable to size, field discovery date, geographical region, type, team personnel and other pertinent factors. The alternative approach could be of value in planning future resource studies.

My comments on the number of ratios of FPC reserves to A.G.A. reserves which either are greater than 2 or less than 0.5 have been given in my response to Mr. Bangert's question (Question 2 in this letter). Dr. Pifer's assertion that the variability between the FPC estimates and the A.G.A. estimates "is significant" is somewhat ill-defined in a technical sense. However, if he means that the A.G.A. estimates tend to be overestimates of proven reserves, I agree wholeheartedly. I would also like to emphasize that those cases in which the FPC estimate differed considerably from the A.G.A. estimate have not gone unnoticed. The field team leaders have cited, as might be expected, a variety of practical reasons for the differences and I accept their professional judgment. The presentation of a complete account of the various practical considerations involved is beyond the scope of this reply. However, the factors leading to many of the A.G.A. overestimates were outlined in the Discussion of Results section of the National Gas Reserves Study as follows:

The field reserves teams based their estimates on production and pressure figures when sufficient historical data were available. In some cases in which an FPC team based its estimate on the production data up to December 31, 1970, the A.G.A. estimate seemingly was either still based on volumetric calculations or production curves which had not been updated. This is the probable cause for many of the differences observed particularly in the Texas Gulf Coast fields and is a strong justification for the continuous monitoring of reserves.

Dr. Pifer's findings based on his analysis of the ratios of the FPC estimates to the A.G.A. estimates are not surprising. Other realistic factors, apparently not considered by Dr. Pifer, are involved which would lead an expert in the subject area to anticipate greater variation of the ratio for the smaller fields than for the larger fields. Similarly, the variation shown between the average ratios for the FPC, U.S.G.S. and U.S. Navy teams might well be expected as a reasonable range especially in view of the differences in the types of fields examined. His assertion that the cause of this difference is the fact that the U.S.G.S. have developed their own basic raw data and, therefore, did not rely on company-supplied information is completely untrue. The basic raw data in the files of the U.S.G.S. were supplied to them by the companies and are *exactly* the same type of data analyzed in company offices by the FPC teams. It seems axiomatic that the magntiude of an individual's or team's reserve estimate is independent of whether the estimate is made in a Government office or in a company office as long as the same information is available.

Dr. Pifer did not mention, although the information was available to him, that for the one field examined by both an FPC team and a U.S.G.S. team, the FPC team's estimate was the higher of the two.

Before leaving this topic I would like to add that Dr. Pifer was given the data used in his analysis of the ratios so that he could perform duties outlined in Purchase Order 1067 (Exhibit B). Item 2e in the section on Requirements and Scope of Work specifies as follows: "Coordinate his work with the Technical Director of the National Gas Survey or his Representative."

Dr. Pifer never presented his analysis of the ratios to me. I first saw his analysis when I obtained a copy of his statement to the Subcommittee.

Some of the data used and analyzed in the NGRS are considered confidential (see the Commission's Orders of December 21, 1971 and March 9, 1972). However, the report does contain a considerable amount of useful information. The cited lack of a comparison of NGRS and A.G.A. data seems a little strange in view of the fact such a comparison is given on page 3 of the NGRS report.

The chronology of events relating to the Statistical Validation Team has been given in detail in the report of the Statistical Validation Team which is Appendix VI of the National Gas Reserves Study. That information which is presented in the Background Section will be repeated here for the record because it shows that, to the extent possible within the physical constraints of time and scheduling, all possible options which bore on the statistical design and analysis aspects of the study were left open to the Statistical Validation Team.

The activities of the Statistical Validation Team as outlined in the Reserves Study Order fall within two broad categories: (1) the formulation of procedures for selecting a sample of gas fields for analysis by the government field reserves teams; and (2) the estimation of the aggregate nonassociated and associated gas reserves and the reliability of the estimate based on the results of government field team analysis of reserves for the fields making up the sample.

After the Reserves Study Order was set forth it was necessary to accomplish other tasks before either of the above activities could be initiated.

Before the sampling procedures could be formulated, it was necessary that: (1) An organization be selected and commissioned by the Federal Power Commission to serve as the Independent Accounting Agent; (2) The data stipulated in the Reserves Study Order be transmitted to the Independent Accounting Agent by the industry representative who provide A.G.A. reserves figures; (3) The reserves data be processed by the Independent Accounting Agent and a report on the accuracy of the data reduction prepared; and (4) The initial stratification [frequency distribution] of gas fields be prepared by the Independent Accounting Agent for consideration by the Statistical Validation Team.

Before the aggregate reserves could be determined it was necessary that: (1) The reserves for the fields designated in the sample be estimated by the field reserves teams; and (2) The statistical parameters be calculated by the Independent Accounting Agent for use by the Statistical Validation Team.

Immediately after execution of the Reserves Study Order, the Federal Power Commission staff initiated the procedures necessary to acquire the services of an Independent Accounting Agent. The necessity for a departure from the outlined sequence, however, was recognized during the planning of the National Gas Reserves Study. First, it was believed that considerable time would be required for the field reserves teams to make all of the necessary reserves estimates. Second, it was believed that the time required to complete all steps for selecting a sample would be considerable.

Field teams were sent on five trips in January and February of 1972 for the purpose of (1) training personnel who would participate heavily in the project, and (2) determining the time required for making individual field reserves estimates which would serve as a basis for future planning. These initial trips confirmed that the time requirements for making the field reserves estimates would undoubtedly be critical in the schedule for the study. When the overall time limitations were also considered, the urgency of fully developing this phase became apparent. A proposed procedure was the stipulation of 102 major gas fields to constitute the certainty stratum of the sample. It was felt at that time that the 102 major gas fields might contain all fields with reserves greater than 400 Bcf, accounting for about 50 percent of the total reserves.

On February 3, 1972, Mr. Thomas H. Jenkins, Dr. Marie D. Wann and Dr. Paul J. Root discussed the designation of the certainty stratum. Dr. Wann, in a memorandum to Mr. Thomas H. Jenkins on February 4, 1972, suggested that the National Gas Survey proceed with the reserves estimates of the 102 major fields. The field reserves team scheduling was arranged on that basis, subject to final review by the Statistical Validation Team. This review, wherein the Team stipulated the exact sampling procedure to be followed, became possible after the frequency distributions were prepared by the Independent Accounting Agent.

On March 9, 1972, Arthur Young & Company, in accordance with standard government service procurement practices, was awarded a contract to serve as the Independent Accounting Agent. From April through June 1972, industry representatives who prepare A.G.A. reserves transmitted data to Arthur Young & Company to calculate the necessary frequency distributions (or stratifications of the population of gas fields) for the Statistical Validation Team to use in stipulating the techniques and procedures to be followed in order to obtain a valid sample.

The Statistical Validation Team met on May 10, 1972, to discuss the Reserves Study Order, the role of the Team in the study, progress made in implementing the Order, aspects of statistical sampling theory pertinent to the study, and procedures to be followed by the Team. The Team reserved specific recommendations until the preliminary frequency distributions were available.

The Statistical Validation Team met again on July 27, 1972, to review the initial stratifications prepared by Arthur Young & Company. The Team recommended that revised stratifications with a reduced number of classifications according to size, geographical area and field discovery date be prepared. In regard to the certainty stratum, the Team suggested that Mr. Lawrence R. Mangen, Mr. William L. Monroe and Dr. Paul J. Root obtain from Arthur Young & Company a list of the names of 108 fields shown on the frequency distribution to contain reserves greater than 400 Bcf and compare it with the initial list of 102 major fields. It was further recommended that the comparison of the lists be made by the above group of FPC staff members to determine if an undue number of fields and consequently an undue amount of field team work would be involved in changing the definition of the certainty stratum to the 108 fields listed by Arthur Young & Company. The group was advised that if the amount of additional work involved were not prohibitive, then the list of 108 fields would be considered as the certainty stratum. However, if the group determined that the amount of additional work involved were prohibitive, it was to check with the Statistical Validation Team for further instructions.

The amount of additional work involved in making this change was determined not to be appreciable, hence the 108 fields were considered thereafter to constitute the certainty stratum. On August 29, 1972, Mr. John K. Sheehan of Arthur

Young & Company delivered a listing of the 108 fields with reserves figures to Mr. Lawrence R. Mangen, the supervisor of the Independent Reserves Teams.

During the period from July 27 to September 15, 1972, technical details of the method for selecting the sample of smaller fields were discussed by Mr. William L. Monroe and Dr. Paul J. Root with the various individuals associated with the Statistical Validation Team. All of them were given the opportunity to comment on the proposed procedures, which were then revised and modified in response to comments and objections received. Final instructions were given in September 15, 1972, to Arthur Young & Company to develop the list of fields constituting the remainder of the sample in accordance with the techniques prescribed by the Statistical Validation Team.

These instructions specified that the remainder of the sample would consist of approximately 300 fields partitioned into six modules of approximately 50 fields each. In addition, they specified the order in which the modules would be considered for actual field work. The preliminary written instructions and the particular values of the parameters to be used for the actual sample selection process were prepared by Dr. Basil P. Korin. The final specifications transmitted to Arthur Young & Company contained modifications required to accommodate the suggestions received from other members of the Statistical Validation Team. The principal suggestions were that the number of fields to be drawn from the smaller size strata should be increased, and that the field list within each stratum should be randomly ordered before selection of the sample. The six modules of smaller fields were selected as stipulated by the Statistical Validation Team, and six lists of field names, one for each module, were delivered to Dr. Paul J. Root on September 22, 1972.

By September 1972 the number of technical experts from the Federal Power Commission's Bureau of Natural Gas assigned to the field reserves estimation efforts had been greatly increased, such that the analysis of the certainty stratum and one module definitely seemed feasible within the general time frame of the National Gas Reserves Study. Therefore, soon after receipt of the lists, field teams began to analyze fields from Module 1, i.e., the module designated as having top priority. On October 10, 1972, the lists of fields with reserves were delivered to Mr. Lawrence R. Mangen.

On November 30, 1972, the Statistical Validation Team met to review tabulations showing characteristics of the sample, to discuss the methods to be used subsequently in analyzing the results of the Study and to discuss the organization of the Team's report. There was considerable sentiment that the statistical analysis presented in the Team's report should be based on conventional methods for estimating population properties from the sample statistics. However, it was felt that an alternative approach, based on regression analysis, should be presented in a separate report because it could potentially portray differences attributable to size, field discovery date, geographical region, type, team personnel and other pertinent factors. The alternative approach could be of value in planning future resource studies.

The statistical methods used by Arthur Young & Company in processing the field team results for analysis by the Statistical Validation Team were transmitted by letter to Arthur Young & Company on January 17, 1973. The letter also served as a means of relaying instructions dealing with the preparation of data to be used internally within the Statistical Validation Team for estimates of total reserves to be made using alternative methods.

On January 29, 1973, Arthur Young & Company submitted the computer program for calculating the independent reserves estimate to Mr. William L. Monroe, who verified that the program performed the desired analysis using test data.

On February 2, 1973, independent reserves estimates for a majority of the fields in the certainty stratum, all fields in Module 1 and some additional fields were given personally to a representative of Arthur Young & Company for keypunching and initial processing. Data from the processing of the fields in Module 1 were requested. The last of the field reserves data in the certainty stratum was transmitted to Arthur Young & Company on February 5, 1973. All data were processed by Arthur Young & Company to estimate the total nonassociated and associated gas reserves for the fields on the population list, and the preliminary results were delivered to Dr. Paul J. Root on February 27, 1973.

The Statistical Validation Team met on February 28, 1973, to discuss the information prepared by Arthur Young & Company to indicate the preliminary estimate of the total gas reserves, its precision, and to discuss whether processing of additional modules would be required to obtain a sufficiently accurate total reserves estimate. The Team discussed the composition of the final report and made final assignment for its completion.

In order to insure the accuracy of the individual reserves data used by Arthur Young & Company to calculate the total reserves estimate, the data were listed and delivered personally to Mr. Lawrence R. Mangen. After verification the final estimate of the reserves as reported herein was given to Dr. Paul J. Root on April 10, 1973.

The above excerpt from the report of the Statistical Validation Team is, in my opinion, an accurate account of its activities. I disagree with Dr. Pifer's recollections about the formulation of procedures for the Team as stated in his oral testimony before the Subcommittee. I can emphatically state that this was not done by the field teams supervisor, that the field teams supervisor was not from the University of Colorado at Boulder nor did anyone from the University of Colorado at Boulder participate in any phase of the National Gas Reserves Study.

Similarly, I disagree with Dr. Pifer's contention that he was not given the opportunity to make comments on the report of the Statistical Validation Team. A draft copy of the report was mailed to all members of the Statistical Validation Team on February 8, 1973, (A copy of the transmittal letter is shown in Exhibit H). The draft of the report was discussed at the meeting of the Statistical Validation Team held on February 18, 1973, which Dr. Pifer was unable to attend. Team members were advised that they could send additional comments to me. Another draft revised to reflect comments received from Team members at and subsequent to the meeting of February 18, 1973, was mailed to all Team members on March 20, 1973. (A copy of the transmittal letter is shown in Exhibit I). A special meeting attended by Mr. Wade P. Sewell, Mr. William L. Monroe, Dr. Howard W. Pifer III and me was held on April 4, 1973. One purpose of the meeting was to enable Dr. Pifer to discuss the draft report. Dr. Pifer offered no specific comments at that time but said he would forward his suggestions to us. It should be noted that other comments received as late as April 17, 1973, were accommodated in the report. Specific comments were never received from Dr. Pifer, although I feel that he was afforded ample time and opportunity to make them.

Many of the questions raised concerning the study are not confined within the framework of the objectives of the study and how those objectives were achieved. The purpose and scope are clearly defined in the Natural Gas Reserves Study as follows:

As specified in the Commission's Orders, the reserves study program was designed to yield an independent estimate of the total proven gas reserves in the United States including Alaska and the offshore areas as of December 31, 1970. Non-associated, associated and dissolved gas were to be included in the total estimate.

The scope of the MGRS was limited to an estimation of the magnitude of the proven reserves and did not include an analysis of deliverability, Similarly, no evaluation of the total gas resource base nor forecasts of gas to be discovered in the future were made. Gas volumes which cannot be produced economically now but which might only become available through the application of new technology were not included.

The report provided impartial, unbiased results in fulfillment of its expressed purpose. It presents, for the first time, a comprehensive estimate of the Nation's gas reserves made independently and objectively by a Government agency. The results provide a useful basis for decisions by the Federal Power Commission as well as other government agencies, the Congress and the public.

The views expressed herein are personal and do not constitute an official statement of this Commission.

Respectfully submitted.

Dr. Paul J. Root,
Technical Director, National Gas Survey.

Exhibit A

STATISTICAL VALIDATION TEAM

Daniel M. Bass, Chairman, Petroleum Engineering Department, Colorado School of Mines.

Basil P. Korin, Chairman, Department of Mathematics and Statistics, American University.

Lawrence R. Mangen, Team Leader—National Supply Team, Bureau of Natural Gas, Federal Power Commission.

Daniel F. Merriam, Chairman, Department of Geology, Syracuse University.

Alfred T. Miesch, Geologist, United States Geological Survey, Department of the Interior.

William L. Monroe, Mathematical Statistician, Bureau of Natural Gas, Federal Power Commission.

Howard W. Pifer III, Assistant Professor of Business Administration, Harvard Business School.

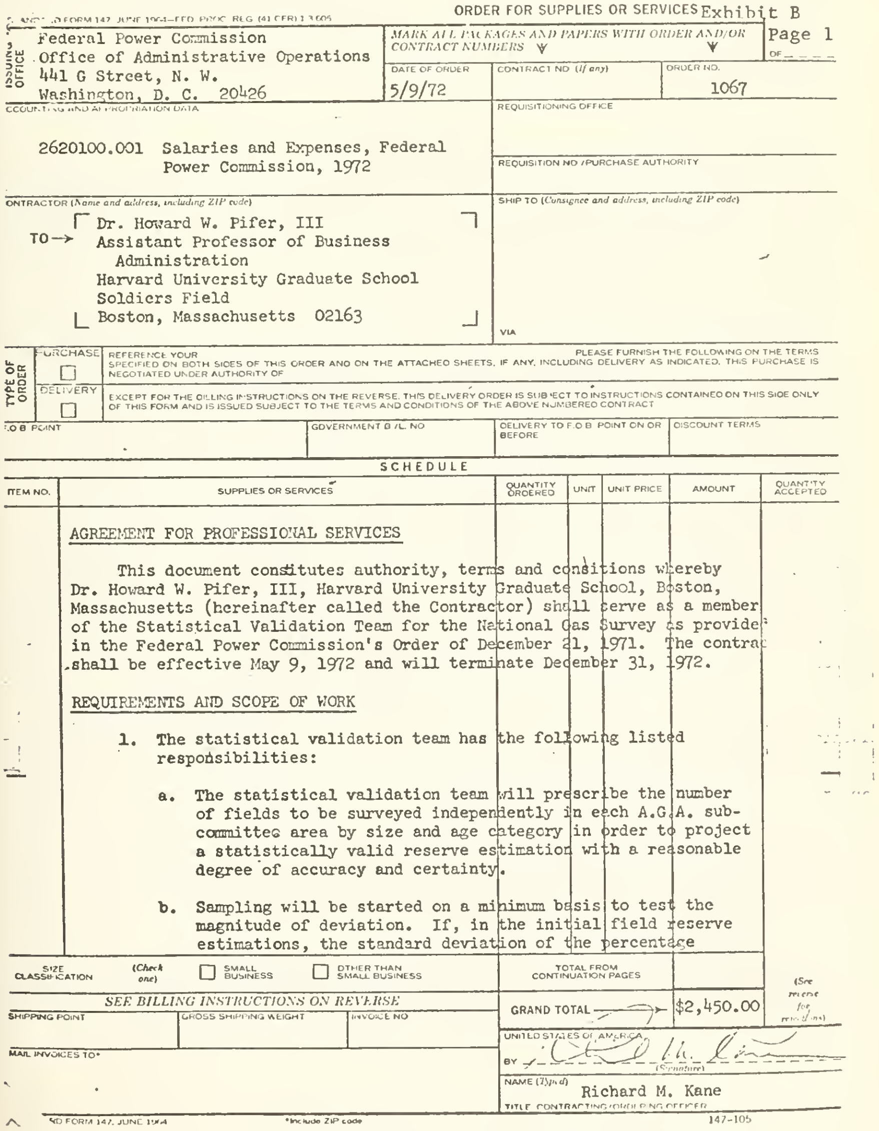
Paul J. Root, Technical Director, National Gas Survey, Federal Power Commission.

Wade P. Sewell, Chief, Division of Econometric Analysis, Office of Economics, Federal Power Commission.

Harry B. Sheftel, Office of Management and Budget.

Joseph Waksberg, Associate Director, Statistical Standards and Methodology, Bureau of Census, Department of Commerce.

Marie D. Wann, Chief Mathematical Statistician, Office of Management and Budget.



FORM 147 JUNE 1964—FED PROC REG (41 CFR) 1-3.605

ORDER FOR SUPPLIES OR SERVICES

Exhibit B

Page 1 OF

ISSUING OFFICE
Federal Power Commission
Office of Administrative Operations
441 G Street, N. W.
Washington, D. C. 20426

MARK ALL PACKAGES AND PAPERS WITH ORDER AND/OR CONTRACT NUMBERS

DATE OF ORDER: 5/9/72

CONTRACT NO (If any):

ORDER NO.: 1067

ACCOUNTING AND APPROPRIATION DATA: 2620100.001 Salaries and Expenses, Federal Power Commission, 1972

REQUISITIONING OFFICE:

REQUISITION NO./PURCHASE AUTHORITY:

CONTRACTOR (Name and address, including ZIP code)

TO→
Dr. Howard W. Pifer, III
Assistant Professor of Business Administration
Harvard University Graduate School
Soldiers Field
Boston, Massachusetts 02163

SHIP TO (Consignee and address, including ZIP code):

VIA

TYPE OF ORDER

PURCHASE ☐ REFERENCE YOUR PLEASE FURNISH THE FOLLOWING ON THE TERMS SPECIFIED ON BOTH SIDES OF THIS ORDER AND ON THE ATTACHED SHEETS, IF ANY, INCLUDING DELIVERY AS INDICATED. THIS PURCHASE IS NEGOTIATED UNDER AUTHORITY OF

DELIVERY ☐ EXCEPT FOR THE BILLING INSTRUCTIONS ON THE REVERSE, THIS DELIVERY ORDER IS SUBJECT TO INSTRUCTIONS CONTAINED ON THIS SIDE ONLY OF THIS FORM AND IS ISSUED SUBJECT TO THE TERMS AND CONDITIONS OF THE ABOVE NUMBERED CONTRACT

F.O.B. POINT:

GOVERNMENT B/L NO:

DELIVERY TO F.O.B. POINT ON OR BEFORE:

DISCOUNT TERMS:

SCHEDULE

ITEM NO.	SUPPLIES OR SERVICES	QUANTITY ORDERED	UNIT	UNIT PRICE	AMOUNT	QUANTITY ACCEPTED

AGREEMENT FOR PROFESSIONAL SERVICES

This document constitutes authority, terms and conditions whereby Dr. Howard W. Pifer, III, Harvard University Graduate School, Boston, Massachusetts (hereinafter called the Contractor) shall serve as a member of the Statistical Validation Team for the National Gas Survey as provide in the Federal Power Commission's Order of December 21, 1971. The contra shall be effective May 9, 1972 and will terminate December 31, 1972.

REQUIREMENTS AND SCOPE OF WORK

1. The statistical validation team has the following listed responsibilities:

   a. The statistical validation team will prescribe the number of fields to be surveyed independently in each A.G.A. subcommittee area by size and age category in order to project a statistically valid reserve estimation with a reasonable degree of accuracy and certainty.

   b. Sampling will be started on a minimum basis to test the magnitude of deviation. If, in the initial field reserve estimations, the standard deviation of the percentage

SIZE CLASSIFICATION (Check one) ☐ SMALL BUSINESS ☐ OTHER THAN SMALL BUSINESS

TOTAL FROM CONTINUATION PAGES:

SEE BILLING INSTRUCTIONS ON REVERSE

SHIPPING POINT:

GROSS SHIPPING WEIGHT:

INVOICE NO:

GRAND TOTAL → $2,450.00

(See reverse for rejections)

MAIL INVOICES TO*

UNITED STATES OF AMERICA

BY (Signature)

NAME (Typed): Richard M. Kane

TITLE: CONTRACTING/ORDERING OFFICER

FORM 147, JUNE 1964

*Include ZIP code

147-105

differences from their mean is too large to assure the desired certainty and accuracy, additional sampling will be carried out as required or the specifications will be modified. The National Gas Survey will balance the time required against the desired accuracy so as to obtain the best results in a reasonable time.

c. When the accounting agent has received all final reserve estimates, he determines the deviation from the mean of the sample. He forwards the deviation information to the statistical validation team.

d. The statistical validation team determines the adequacy of the sample. Additional sampling will be prescribed if it is required to obtain the desired accuracy and certainty.

e. When sampling is sufficient to assure the desired accuracy, the statistical validation team reports to the National Gas Survey. The report will include a description of the sampling procedure and a statement of the reliability of the survey.

2. Specifically, the Contractor will provide the services and accomplish the tasks for the statistical validation team as summarized below:

(*a*) Serve as a member of the Statistical Validation Team as described in FPC's order of December 21, 1971;

(*b*) Assist the Statistical Validation Team in accomplishing the above objectives cited from the order;

(*c*) Attend meetings of the Statistical Validation Team;

(*d*) Participate in the writing of all reports required from the Statistical Validation Team;

(*e*) Coordinate his work with the Technical Director of the National Gas Survey or his representative.

COMPENSATION

Maximum cost to the Government for performance hereunder shall not exceed two thousand four hundred fifty dollars ($2,450.00) and said compensation shall include travel and subsistence expenses. Partial payments may be made on vouchers submitted through and approved by the Technical Director, National Gas Survey. Final payment will be made upon determination by the Technical Director that contract requirements were met.

DATA RIGHTS

All writings, reproductions, drawings, or other graphical representations, and works of any similar nature produced in the performance of this contract shall be the sole property of the Government. The Contractor agrees not to assert any rights at common law or equity and not to establish any claim to statutory copyright in such data. The Contractor shall not publish or reproduce such data in whole or in part, or in any manner or form, nor authorize others to do so without the written consent of the Government until such time as the Government may have released such data to the public.

To the extent applicable, the terms, conditions, and instructions set forth in Standard Form 32 shall bear upon the Contractor in performance hereunder. This procurement is entered into pursuant to Section 302(c)(4), Federal Property and Administrative Services Act of 1949, as amended (41 U.S.C. 252(c)(4).

The Contractor agrees to perform all services set forth or otherwise identified above for the consideration stated herein. Contractor is required to sign this document and return two copies to the issuing office.

United States of America,
Richard M. Kane,
Director, Office of Administrative Operations.

——— ———,
Contractor.

MONTANA COLLEGE OF MINERAL SCIENCES AND TECHNOLOGY,
Butte, Mont., December 22, 1972.

Re Order No. 1101.

Dr. PAUL J. ROOT,
Technical Director, National Gas Survey, Federal Power Commission,
Washington, D.C.

DEAR DR. ROOT: Under the terms of our agreement for my professional services, I was supposed to participate in the following activities.

(*a*) Become familiar with the procedures used by the FPC field reserve teams

(*b*) Work with various FPC field reserve teams

(*c*) Provide special information or advice to field reserve teams operating in the Northwestern portion of the United States.

(*d*) Report on methods relating to estimations of national gas reserves.

(*e*) Coordinate his work with the Technical Director of the National Gas Survey or his representative.

I have completed all the above activities, reported to you twice by telephone and today under separate cover have mailed you a report covering these activities.

Attached please find an invoice for my service.

Very truly yours,

Dr. WILFRED R. MCLEOD,
Department of Petroleum Engineering.

MONTANA COLLEGE OF MINERAL SCIENCE AND TECHNOLOGY,
Butte, Mont., December 22, 1972.

Re Activities with National Gas Survey independent reserve team.

Dr. PAUL ROOT,
Technical Director, National Gas Survey, Federal Power Commission,
Washington, D.C.

DEAR DR. ROOT, On the twenty-third of May, 1972, under order number 1101, the Federal Power Commission and myself entered into an agreement whereby I should assist the staff of the Federal Power Commission by working with the independent reserve teams of the National Gas Survey. Specifically, I was expected to and did participate in the following activities:

(*a*) become familiar with the procedures used by the FPC field reserve teams;

(*b*) work with various FPC reserve teams;

(*c*) provide special information or advice to field reserve teams operating in the Northwestern portion of the United States;

(*d*) report on methods relating to estimations of national gas reserves;

(*e*) coordinate my work with the Technical Director of the National Gas Survey or his representative.

The order, issued December 21, 1971, directing study and analysis of national gas reserves and prescribing procedures for the National Gas Survey was read and clearly understood by this author. I was also briefed by yourself, and later Mr. Tommie Hillis, on the procedures used by the FPC field reserve teams. I might add that these are all clearly defined in the FPC Bureau of Natural Gas Reserve Estimation Manual—a copy of which you sent me.

Following your instructions, on December 3, 1972, I journeyed from Houston, Texas, to join an FPC field reserve team in Cody, Wyoming. The team was composed of Mr. Tommie Hillis, Supervisor, and Bruce Wamsley and David Maldonado, his assistants. The team spent December 4th and half of December 5th in the offices of Marathon Oil Company evaluating a total of thirteen individual reservoirs.

On arriving at the Marathon Oil Company's offices, the members of the team held a conference with various company men who were familiar with the fields to be studied. The fields in question were quite old, records were missing, and had the Marathon Oil Company not been as cooperative as they were it would have been impossible to make a meaningful reserve estimate for many of the reservoirs.

In most of the thirteen reservoirs, the computation of gas reserves was accomplished by the use of production-pressure decline curves. However, material balance, volumetric and time decline methods of computation were also used.

The team left Cody on the afternoon of December 5th in −26°F weather and traveled to Oklahoma City, arriving at about 10:30 p.m. on Wednesday, December 6th, we commenced work in the offices of Texas Pacific Gas Company at 8:00 a.m. After a conference with the company representative, we set to work making our reserve calculations. This particular field, drilled in the 60's, was quite small and consisted of less than twenty wells. Reasonaby accurate pressure and production data along with complete well files were available. Production-pressure decline curves we used for reserve determination. On the morning of December 7th, we left Oklahoma City for Dallas, Texas.

We checked into the offices of the Lone Star Gas Company at about 10:00 a.m. that same day, and after the usual conference with the Lone Star engineers familiar with the field, we commenced making our independent reserve calculations. Again, this field was quite small, consisting of some 13 Lone Star wells and about three wells belonging to other individuals. I recall that there were about eleven plotted P/Z versus cumulative gas production curves. The data points were rechecked by our team and in most cases the curves redrawn and then used to determine remaining resreves. In the case of two wells for which pressure data was inadequate we utilized micrologs and sonic logs to obtain net sand count, porosity, and water saturation; we then carried out volumetric calculations to estimate the gas reserves. We were fortunate to find P/Z versus cumulation gas production information in commercially published data for the other three wells which did not belong to Lone Star but which were situated in the same reservoir. Our work in Dallas was completed at about noon on December 8th, and we all left for our individual homes. I arrived back in Butte, Montana, the next day, December 9, 1972.

GENERAL COMMENTS

In all the gas fields for which we made reserve estimates, the calculation procedure was quite straightforward and can be found in most standard petroleum engineering textbooks as well as in the Natural Gas Reserve Estimation Manual.

As is to be expected, certain on-the spot decisions had to be made from time to time concerning the treatment of data or the use of one computational technique over another. I found the team leader quite competent in this respect. Additionally, the other members of the team also performed their tasks quite competently. Much can be said to the credit of the FPC about the manner in which the team comported themselves. I was quite pleased to be associated with these men and to have had the opportunity to participate in the survey. There seems to be little more that I can add to this report. However, if after you have read it you find that there are areas on which you wish me to elaborate, I shall be only too willing to comply.

Very truly yours,

Dr. Wilfred R. McLeod,
Department of Petroleum Engineering.

Lubbock, Tex., *December 21, 1972.*

Dr. Paul J. Root,
National Gas Survey, Federal Power Commission, Washington, D.C.

Dear Dr. Root: I am writing in accordance with the provisions of FPC Order No. 647 dated November 15, 1972, which is an agreement for professional services to be performed by me in connection with the activities of the independent reserve teams of the National Gas Survey.

The basis and methods of operation of the reserve teams are spelled out in the Federal Power Commission Bureau of Natural Gas *Reserve Estimation Manual*, dated August, 1972, prepared by Mr. Lawrence R. Mangen of the Bureau of Natural Gas. This manual provides background data as to the purposes of the survey, describes the methods to be used, establishes a professional level of performance and conduct for survey personnel, states economic assumptions, and includes useful compilation of technical reference material, including charts, tables and nomographs.

In connection with the requirements of the contract cited I have visited reserve teams in the field as tabulated herewith.

Usual procedure was to establish local contact with the team leader, join the team, review the data in general and in sufficient detail to get the "feel" of the problem, and then participate as possible in the actual compilation procedure. In the course of this association it was usually possible to develop a personal acquaintance with the individual team members, and also to determine the atmosphere in which the work was being conducted.

In all cases I found the teams to be operating in a competent and efficient manner, and adhering as closely as possible to the guidelines contained in the *Reserve Estimation Manual.* I may add that they exhibited a high degree of dedication. The relations between team members and the company representatives to my observation were professionally correct. The operators' representatives wre cooperative and courteous, and at the same time avoided anything that might be construed as an attempt to influence or modify the work of the teams. I formed the impression that the team visits created a new awareness of and respect for the technical proficiency of F.P.C. personnel, and in one or two cases the company men welcomed the teams' investigations as supplementing work that they had not themselves been able to extend, reportedly because of personnel shortages.

Most of the work observed was done on the basis of pressure vs. cumulative production curves, and in well-documented fields the results had a high degree of reliability. However, in some cases information was less complete, or as at Cotton Valley, complicated by re-injection of gas or liquids. The MPI Ellenburger Field studied by Mr. Bassett's team at Midland consisted of only four wells with meagre production history and reservoir data, and had to be handled by volumetrics in a notoriously difficult reservoir. In this case the team used the only method possible, and was fully aware of its specific limitations.

One of the by-products of this survey may prove to be the establishment of more useful and widely-accepted standards of reserve estimation for natural gas fields. The FPC *Manual* provides a useful text that should be widely accepted if available. For what may be the first time a comprehensive national survey is being made with methods and standards coordinated in detail. However, certain important criteria need to be established, such as uniform minimal or cut-off reservoir pressures. Should reserves be calculated to a terminal 500 psia? 1000 psia? vacuum? The difference is proportionately less important in the high-pressure fields, but may involve important gas volumes in large-volume reservoirs.

Another point perhaps deserving study has to do with completeness of present development. By the time the team has finished its study of a field, it may have an opinion as to the possible existence of undrained or undrilled acreage, either in extension of or within proved producing areas, or in other reservoirs of the same structure. An estimate, however qualified, would be useful for planning purposes, and the teams are certainly competent to make them, within proper guidelines.

The chief problems will undoubtedly be in the carbonate reservoirs, and here it would be valuable to tackle the toughest of them, to find out just how much variation of reliability may exist. It would also appear that a special attempt might be justified to take on a great variety of the smaller fields—more than the now planned—particularly where there is reason to believe that the principal operators may not be ideally staffed from the technical standpoint.

Very truly yours,

FRANK B. CONSELMAN, Ph. D.,
Contract Consultant.

Dates	Place	Team leader	Team members	Host operator and representative	Fields surveyed
Nov. 13, 14	Corpus Christi, Tex.	Wayne Thompson	Bernie Karp, Wm. Howard, Carl Pavetto, and Dan Plum.	Humble O. & R. Co. (O. M. Stewart).	Tom O'Connor (Texas).
Nov. 14-1/	do	Frank Baker	Thomas Ross and James New.	Mobil Oil Co. (W. G. Kimbrough) and Arco (S. W. Coan).	Thompsonville (Texas).
Nov. 28	Midland, Tex	John Bassett	Douglas Howard and Sam Hazou.	Mobil Oil Co. (Virgil Stone).	MPI Ellenburger (Texas).
Nov. 29, 30	Bossier City, La	John Olson	Charles Cook, Larry Hamby, and Marvin Barnes.	Cotton Valley Operators Commission (T. L. McGinnis).	Cotton Valley (Louisiana).
Dec. 13, 14	Houston, Tex	James N. Hicks	Frank Olson and John Dante.	Southern National Gas Co. (H. K. Heberling).	Patterson (Louisiana).

LOUISIANA STATE UNIVERSITY
AND AGRICULTURAL AND MECHANICAL COLLEGE,
Baton Rouge, Ala., May 19, 1972.

DR. PAUL ROOT,
U.S. Federal Power Commission,
Washington, D.C.

DEAR DR. ROOT: At your request I am giving you my evaluation of the performances of the Reserve Teams I worked with this spring in New Orleans on their visits to Texaco, Amoco and Humble. In my opinion all three of the team leaders were very competent and on a team basis I would rate two of the teams very good and the other excellent. They were all well organized and very capable in their evaluations. I should like also to comment on the very fine cooperation extended to the Reserve Teams by the three companies. It was a pleasant and cooperative atmosphere to work in.

In summary perhaps I should state what I have implied in the above remarks: that these teams are without doubt obtaining reliable reserve data.

Yours very truly,

MURRAY F. HAWKINS, Jr.,
Head, Petroleum Engineering Department.

LOUISIANA STATE UNIVERSITY
AND AGRICULTURAL AND MECHANICAL COLLEGE,
Baton Rouge, La., June 30, 1972.

DR. PAUL ROOT,
U.S. Federal Power Commission,
Washington, D.C.

DEAR DR. ROOT: During June I worked with Reserve Teams in the Houston offices of Marathon Oil Company and Union Oil Company of California. I found both team leaders very competent but members of the teams much less experienced than those I saw during my New Orleans visits. The effect of this appears to be to work the team leaders harder and possibly to slow the effort somewhat; however the quality of the work is excellent.

Both oil companies provided very nice working space and were very cooperative with the teams.

Yours very truly,

MURRAY F. HAWKINS, Jr.,
Head, Petroleum Engineering Department.

EXHIBIT G

U.S. DEPARTMENT OF THE INTERIOR,
GEOLOGICAL SURVEY,
Denver, Colo., February 7, 1973.

MR. PAUL ROOT,
Technical Director, National Gas Survey, Federal Power Commission, GAO Building, Washington, D.C.

DEAR PAUL: As I related to you on the phone yesterday, I have become somewhat concerned over some of the statistical methods proposed for the analysis of data being accumulated for the gas survey. Perhaps my concern is unwarranted, but I am pleased to accept your suggestion to put it in writing for your information or for distribution to the Statistical Validation Team.

I believe that it is imperative in this undertaking that the statistical methods be as simple and straightforward as possible, and that there be as little room for challenge as possible. The method being used for sampling the fields less than 400 bcf is simple and straightforward—a statisfied random design—and is generally recognized as one of high efficiency. The method has been convention for a long time and the methods for estimating the means and its variance are well-established. This is not to say that these methods can't be improved upon, but I do say that this is not the place to try to do it.

In some hand-written notes included in with some other materials I received from you recently, equations are given for 4 different methods for estimating the total reserves, labeled in the notes as (1) Classical Stratified Sampling, (2) Ratio

Adjustment, (3) Difference Adjustment, and (4) Linear Regression. Three of the methods would employ the AGA data, and thus would not provide independent reserve estimates. One of the methods (Difference Adjustment) is totally unfamiliar to me, but I note that the difference correction term goes to zero when the average reserves in the sample equal the average reserves in the population. If this happens in a given size-stratum, the fields in the stratum would not be included in the total reserve estimate.

We have also discussed some various other regression methods for estimating total reserves. The methods may have a great deal of merit, but they are new in this type of problem so far as I am aware, and I suggest that they be avoided for the immediate purpose.

As you can see, I have some fear that the Statistical Validation Team is going to arrive at some conflicting answers and that some of these answers may not be subject to easy defense. I don't see any need for this. The procedures used to sample the fields were straightforward and perfectly geared toward use of some highly conventional methods of computation to arrive at unbiased estimates of both the total reserves and of error bounds for it. I do not believe we should be developing new approaches at this time.

I don't know whether I'm alone in my concern or whether some others who attended the last meeting and perused the materials sent out recently might feel somewhat the same way. Anyway, I appreciate your suggestion that I use this means to state my opinion.

Sincerely yours,

Alfred T. Miesch,
Research Geologist.

Memorandum

February 8, 1973.

To: Statistical Validation Team Members and Observers.
From: Paul J. Root, Technical Director, National Gas Survey.
Subject: Draft Material for Review by the Statistical Validation Team.

Enclosed are the following items relative to the Statistical Validation Team Report:

(1) Revised Outline.
(2) Draft Chapter 1—Introduction.
(3) Draft Chapter 2—Background.
(4) Draft Chapter 3—Sampling Procedure.

The outline represents a revised version of that sent to you with my letter of December 19, 1972. It reflects modifications which were made as drafting of the report of the Statistical Validation Team, the reports of the other components of the National Gas Reserves Study and the overall Study report progressed.

The title given to Chapter II does not seem appropriate. It seems more like a chronology of the Statistical Validation Team activities. Perhaps someone can suggest a better title. Similarly, I would welcome any other criticisms or comments you may wish to make about the enclosed material.

The next meeting of the Statistical Validation Team will be held in Room 4008 of the offices of the Federal Power Commission at 1:30 p.m. on February 28, 1973.

I look forward to seeing you at that meeting.

Paul J. Root,
Technical Director, National Gas Survey.

Memorandum

March 20, 1973.

To: Statistical Validation Team Members.
From: Paul J. Root, Technical Director National Gas Survey.
Subject: Review of the Draft of the Final Report of the Statistical Validation Team.

Enclosed is a revised draft of the Statistical Validation Team Report which includes all tables and figures except for the map indicating the definition of the geogrphical regions. We would appreciate having your comments and suggestions pertaining to possible additions, deletions and modifications as soon as possible. In particular, we need your comments on the discussion of the reliability of the estimate and suggestions as to how to describe the combined effect of sampling error and measurement error.

Responses should be directed to either Mr. William L. Monroe or me before April 2, 1973, as we would like to complete the report in early April. It should be possible to accomplish the editing and publication of the final report through correspondence and telephone calls and another meeting of the Statistical Validation Team will probably not be required.

Inclusion of the figures for the reserves of the AGA omitted fields will not be included in the Statistical Validation Team report, but will be included in the report of the Independent Accounting Agent.

We plan to continue the work on the regression model and subsequently to publish a report on those efforts. Dr. Howard Pifer will discuss this phase of the statistical analysis with the FPC members of the Statistical Validation Team in early April.

PAUL J. ROOT,
Technical Director, National Gas Survey.

FEDERAL TRADE COMMISSION,
BUREAU OF COMPETITION,
Washington, D.C., February 1, 1974.

Dr. PAUL J. ROOT,
Technical Director, National Gas Survey, Federal Power Commission, Washington, D.C.

DEAR DR. ROOT: I have the courtesy copy of your letter to Senator Hart dated July 27, 1973. In that letter, you comment on sundry statements made on June 26–28, 1973 at hearings held by the Senate Subcommittee on Antitrust and Monopoly, including remarks made by me on June 27 with regard to American Gas Association (AGA) reporting of proven reserves. I also have the courtesy copy of your November 20, 1973 letter to Senator Stevenson in which you comment on statements made by me during the course of a Senate Commerce Committee hearing on October 11, 1973. Since the matters discussed in your November 20, 1973 letter essentially duplicate issues raised in your July 27, 1973 letter, I have specifically directed my comments to your July 27 letter but they are equally applicable to your November 20, 1973 letter. In replying to you, I am requesting that Senator Hart and Senator Stevenson make a copy of this letter a part of the record of their respective hearings. I wish to emphasize that this response reflects personal views and is not an official statement by the Federal Trade Commission.

The first four and one half pages of your letter relate to the Federal Power Commission's National Gas Survey (NGS) and the report of this survey entitled "National Gas Reserves Study" (NGRS). The NGRS presents an estimate of the proved reserves of natural gas in the United States as of December 31, 1970. As you indicate (page two), of the 6,358 gas fields identified by the NGS, all 108 fields thereof reported by the AGA to contain 400 Bcf (billion cubic feet) of gas or more (referred to in the NGRS as the "certainty sample") were surveyed, but only 50 of the 6,250 "under 400 Bcf" fields were surveyed. It is noted that the 6,250 fields were divided into six stratum according to the amount of reserves of gas in each field as reported by the AGA, and that the 50 fields were then randomly selected from these stratum, with the number drawn from any one strata determined in part by standard deviation figures derived from AGA reserve estimates for the fields in the strata.

Based upon this survey of 158 fields, the NGRS concludes (Appendix VI, page 25) that "the estimate of statistical reliability attributable only to sampling can be expressed by stating that there is 95 percent confidence that the reserves lie within 22.0 Tcf [Trillion cubic feet] (or 10 percent) of 228.5 Tcf." I have no quarrel with this statement as a mathematical expression, but I am highly concerned with the sampling procedures that underlie it. Specifically, I am concerned that the sampling was weighted toward fields in which AGA under-reporting was least likely to occur and that few if any fields were surveyed in which AGA under-reporting was most likely to occur.[1]

Staff of the Bureau of Competition has reviewed AGA estimates of fields in the Offshore Area of South Louisiana and has concluded that tracts reported by the AGA to contain relatively small amounts of reserves are most frequently the ones that are most seriously under-reported.[2] This suggests that had the purpose of the NGS been to examine critically the accuracy of AGA figures, the certainty sample would have been drawn from among those fields reported by the AGA to contain relatively small amounts of natural gas. Instead, the certainty sample was drawn from the fields reported by the AGA to have the most gas and this bias was continued throughout the stratum. Thus the NGS sampled .21% of the fields in the 0–1 Bcf and 1–5 Bcf stratum, .41% of the 5–10 Bcf strata, 1.25% of the 10–50 Bcf strata, 3.53% of the 50–200 Bcf strata, 4.95% of the 200–400 Bcf strata, and as noted, 100% of the over-400 Bcf strata. In all, only 26 of the 5,620 fields reported by the AGA to be under 50 Bcf in size were surveyed.

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[1] The significant role played by producers in establishing the procedures used by the NGS to estimate proved reserves is summarized in an attachment hereto.

The relatively under-developed, significantly under-reported fields have been as might be anticipated, fields with comparatively recent discovery dates. However, the NGS rejected stratification by discovery date. As a result, only 18 of the 50 randomly selected fields had discovery dates as recent as 1960–1970, and there is no way of knowing from any published data from which strata these 18 were drawn.

Further, the Federal Power Commission is well aware that AGA under-reporting is particularly suspect in Offshore South Louisiana, as well as in the Rocky Mountain region and Alaska.[3] Notwithstanding this fact, the NGS rejected stratification based on geographic distribution. As a result, only nine of the 50 randomly selected fields were located in Offshore South Louisiana and in the Rocky Mountain region, with none being drawn from Alaska. Whether any of the nine were drawn from fields with discovery dates as recent as 1960–1970 and from the 50 Bcf and under stratum is unknown.

The selection of only 26 fields out of 5,620 in the suspect 50 Bcf and under stratum, with only a few if any having been drawn as well from the suspect geographical regions and the suspect discovery date group, is in my opinion a prescription for overlooking AGA under-reporting. As the NGRS acknowledges, usage of a confidence interval requires some degree of normal or symmetrical distribution (NGRS, Appendix VI, page 26) and failure to adequately sample from population stratum introduces the possibility of major error in estimating these stratum (NGRS, Appendix VI, page 18). The meager random sampling by the NGS not only fails entirely to recognize the possibility of asymmetry in population due to AGA under-reporting, but it leans over backwards to avoid discovering it.

It was the Federal Power Commission's concern over the accuracy of reserve reporting in Offshore South Louisiana that led to the mailing of questionnaires, on August 14, 1969, to producers requiring them to furnish detailed information on reserves in all fields (over 200) in that area. Producer opposition to these questionnaires resulted in FPC abandonment of this inquiry. The Federal Trade Commission investigation seeks much of the same information from producers which the FPC sought. Until a field by field check is made on all AGA estimates for Offshore South Louisiana, and possibly of the San Juan and Uinta-Green River sub-areas of the Rocky Mountain region and of Alaska as well, the NGS estimate, like the AGA estimate, will remain suspect.

The NGS limited its sampling from small fields and eschewed stratification by geographic area and field discovery date in part through reliance on standard deviation figures derived from AGA reserve estimates. Your conclusion (page five) that any distortions through the use of AGA figures would have relatively little effect on projected total reserves, because the standard error "takes into account variability of measurements within strata," misses the point that the "standard error" takes into account only such variability as its sampling method is designed to detect. A check on the accuracy of critical AGA figures might have revealed, as our investigation has thus far revealed, far more deviation than AGA figures in fact reflect. This check, which could well have dictated a radically different approach to sampling, was never made.

Your observations (pages three and four) that there were, among the 50 randomly selected fields, less instances in which NGRS estimates exceeded AGA estimates by a ratio of 2:1 than instances in which the reverse occurred can likewise be explained in terms of biased sampling. The fact that there were four instances among the 50 fields in which NGRS estimates exceeded AGA estimates by a ratio of 2:1 and no such instances within the certainty sample appears to corroborate my statement that AGA under-reporting is more prevalent among smaller sized fields.

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[2] The Federal Power Commission has apparently also been suspicious of AGA under-reporting of reserves in these comparatively undeveloped fields, as witness its uncommitted gas reserves study made in connection with the South Louisiana rate case.

[3] E.g., see [FPC] Staff Counsel's answer in Opposition to Petition to Reopen Proceedings, pp. 3–4, AR69–1 as regards offshore South Louisiana and Appendix A of FPC Order No. 435 regarding the Rocky Mountain region. The AGA has admitted publicly that its 1968 and 1969 estimates of proved reserves were under-reported by 26 Tcf.

At page three you state that "[i]t is extremely misleading to refer to percentage discrepancies [between AGA estimates and NGS estimates], because doing so implies that one of the two estimates is considered to be the true value." Notwithstanding this statement, you conclude one page later that comparisons between certain AGA and NGRS estimates "lend strong support to any contention that the AGA proven reserves total is an over-estimation." The NGRS is replete with charts comparing NGS and AGA estimates, e.g. see pages 3 and 18 of the NGRS and page 21 of Appendix VI thereof, and it concludes at the outset (page 3) that "[t]he NGRS estimate is lower than the estimate by AGA; however, the difference is less than 10 percent."

NGS reserve team supervisors were not only encouraged to compare their estimates with AGA estimates but with any other available estimates, including Form 15 estimates, published industry estimates, and U.S.G.S. data (see NGRS, Appendix I, page 8). If the NGS had required producers to furnish their own in-house estimates and back-up calculations, as we have required in our investigation, NGS personnel would have been in a far stronger position to assess whether all relevant raw data had been made available to them upon which to base an estimate. Likewise, if raw data had been sought from more than one producer in each field as was not the case with the NGS, NGS personnel would have had an additional check on whether all relevant raw data had been furnished.

One further comment on the NGS before turning to your comments on my remarks of June 27. The NGS assigned the task of compiling a list of gas fields not reported by the AGA to the Oil Information Center (OIC) of the University of Oklahoma Research Institute. The NGS directed the OIC to perform this task by using its "data base" and other information sources—each of the other information sources that was specified is a government publication (see NGRS, Appendix II, page 1). The apparent sources for the data base itself were government production reports (in the 12 states that publish them) and otherwise, the International Oil Scouts Annual Review (See NGRS, Appendix III, pages 3–5).

It is dubious whether production reports are the best sources for locating fields not in production. The Oil Scouts is a producer organization subject to the same influences as the AGA subcommittees which estimate reserves. While government publications may be useful sources for compiling a universe of gas fields, staff members of the Bureau of Competition have found no source in this regard equal to the unpublished well drilling, testing and completion reports maintained by the Federal and state governments—apparently the OIC overlooked this source. Further, our investigation has uncovered a number of instances in which temporarily abandoned reservoirs contained gas in paying quantities which was not reported to the AGA. Notwithstanding this, the OIC mathematically eliminated all "abandoned or temporarily abandoned fields or pools" (NGRS, Appendix III, page 7) from its list of gas fields to be estimated by the NGS.

With regard to statements in your letter specifically addressed to my remarks, the first appears at page five and is to the effect that my remarks of June 27 are unsupported by documentation and meaningless unless a definition of reserves is stated. This is to assure you that my remarks were based entirely upon documents, obtained primarily from producers of natural gas, and that all of these documents are still in the custody of the Federal Trade Commission. As for a definition of reserves, I stated specifically (Tr. 227):

> It was found that proved reserves is a term used industry-wide and that the definition of proved reserves utilized by the AGA is also the definition employed by companies.

In our investigation, the companies which have thus far made formal returns on their subpoenas have indicated that they employ the AGA definition of proved reserves.

It was never my intention to imply (as you seemingly, at page seven, allege) that the NGS does not constitute an independent estimate of reserves. My sole concern in the remarks that you quote (page seven, top) was that the FPC (or for that matter any other agency) use particular care to obtain from producers *all* the raw data that is necessary to make a complete estimate of the reserves in a field.

At page nine you conclude that the "FTC investigation might be characterized as one involving the processing of 'paper reserves'," apparently basing this on my remark (Tr. 226) that:

> [T]he [FTC] investigation was not attempting to make original estimates of proved reserves in South Louisiana but was instead attempting to obtain reserve estimates already proposed.

As you may know, the FTC has issued subpoenas to eleven major producers in Offshore South Louisiana. Each subpoena is identical in form. Specification G calls for, *inter alia*, all company documents containing "estimates or evaluations of the volume of natural gas present or recoverable or ultimately recoverable . . . (3) in specific fields, portions of fields, leaseholds and/or portions of leaseholds located in Offshore South Louisiana." Specification I calls for all company documents which "refer, analyze, . . . relate to . . . [a]ny natural gas estimates or evaluations called for by Specification G; the preparation or completion of such estimates or evaluations; the procedures, criteria or interpretations used in such preparation or completion . . ." etc. While staff already has compared various estimates set to paper, it will also have and plans to make use of the raw back-up data and calculations in order to check out the estimates. Moreover, staff, working with required consultants, will compare reserves and also audit a number of them.

In your final comment (page nine) you state that further evaluation of our investigation should be withheld until there has been as much public scrutiny of our investigation as there has been of the NGRS. While I am not convinced that all aspects of the NGRS have been subjected to public scrutiny (see attachment), nevertheless I support your apparent view that a full evaluation of our investigation should not be made until it has been completed. If you have occasion to read some of the comments filed with Senator Hart's Subcommittee as a result of my testimony and my responses thereto, you will discover that others, by readily assuming that we employed definitions and procedures in our investigation which in fact were not utilized, have already sought to evaluate the definitions and procedures and, therefore, the results of our investigation. Nevertheless, I welcome these comments as well as yours since they have engendered the public interest which the situation clearly warrants.

Very truly yours,

Enclosure.

JAMES T. HALVERSON,
Director, Bureau of Competition.

ATTACHMENT

By order of April 6, 1971, the FPC established three advisory committees. The relevant one for this discussion is the Technical Advisory Committee—Supply. This committee is headed by Myron A. Wright, Chairman of the Board of Humble Oil Refining Company (now Exxon USA) with Dr. Paul J. Root, Technical Director National Gas Survey, serving as the FPC's Coordinating Representative and Secretary. On December 21, 1971 a Supply—Technical Advisory Task Force—Natural Gas Supply was announced by Order of the FPC. This Task Force is organizationally responsive to the Technical Advisory Committee—Supply. The Task Force Director is Ralph W. Garrett, Exploration Analysis Manager, Humble Oil and Refining Company (now Exxon USA). The Deputy Director is Worthy Warnack, Geologist, Humble Oil and Refining Company (now Exxon USA). Task Force members include employees of Phillips Petroleum Company, Union Oil Company of California, Gulf Oil Corporation, Texaco Incorporated, Standard Oil Company (California), Mobil Oil Corporation, Shell Oil Company, Atlantic Richfield Company, Amoco Production Company, and United Gas Pipeline Company. Dr. Root is also the Coordinating Representative of this group.

This Task Force and the Advisory Committee—Supply were responsible for formulating the procedures used in the Study. Although the Task Force was first authorized on December 21, 1971, the minutes of an October 21, 1971 meeting of the Executive Advisory Committee indicate that the Task Force on Supply had its first meeting on September 15, 1971. This meeting appears to be in direct contravention of Executive Order 11007 because the FPC had not as yet authorized the Task Force's creation nor had it specifically determined on the formal record that this Task Force would be in the public interest. The Task Force had an indeterminate number of meetings between September 15 and December 21, 1971. At least one of these meetings was held in Humble's Office in Houston. No minutes are available for these meetings which is also in direct contravention of Executive Order 11007

By another order, also on December 21, 1971, the Commission announced the procedures of the Study. A portion of the third paragraph is particularly important, "The Task Force on Natural Gas Supply to the Survey's Supply Technical Advisory Committee recommended procedures for such a survey and analysis at its December 14, 1971 meeting." Thus, in addition to this September 15 meeting, there was a December 14 meeting. There are also no minutes available of the December 14 meeting of the Task Force so it is impossible to tell whether the FPC had any input at all into the procedures as adopted.

Senator Hart. The committee will be in order.

I am sorry that I was not here when we recessed, having left to get to a vote on the floor. I would have thanked the chairman and his associates from the Power Commission for the time they gave us.

We resume now to hear from Prof. Howard W. Pifer, of the Graduate School of Business of Harvard University.

Professor, I apologize for your having been delayed so long today and I understand that you are going to permit us to print your statement in full in the record and you will try to develop it through questions. For those here in the committee room not familiar with the reason that we believe you can contribute substantially to this record, I should point out that Professor Pifer was an independent member of the Power Commission's national gas reserve study and, I believe, also a member of the Technical Advisory Committee for Supply for the National Gas Service.

This one paragraph underscores Professor Pifer's expertise:

> On April 28, 1972, I agreed to serve on both the Technical Advisory Committee for Supply—Tac—of the NGS and the Statistical Validation Team of the NGRS, stating that my interest in serving on these committees stemmed both from the realization of the complex energy issues faced by regulatory agencies, in general, and from an understanding of the technical forecasting problems specifically associated with estimating natural resource reserves.

Senator Hart. Now, some of the questions.

Your statement and accompanying letter is critical of the survey and reserve study. Unless there is some feeling that your recent criticism stems from a deep commitment in opposition to the suggested deregulation, I ask you if I do or do not understand you correctly, that you may come out on the side of deregulation?

STATEMENT OF HOWARD W. PIFER III, PROFESSOR, GRADUATE SCHOOL OF BUSINESS ADMINISTRATION, HARVARD UNIVERSITY

Professor PIFER. That is quite possible. In my statement, what I tried to indicate is that I have not taken a position and I believe, as an independent member of both the Natural Gas Survey and the Natural Gas Reserve Study, that I should remain independent and be convinced by the information made available. I cannot at this point come out with a recommendation regarding deregulation, and I am concerned primarily with whether we do have a gas shortage.

If I understood Chairman Nassikas, he was basically saying, "Try it, you may like it." I am very concerned about that opinion regarding deregulation. I feel the industry has, in general, felt that way. I think the studies thus far that have been done to test out social behavior have been negative. For example, the negative income tax tried in New Jersey—when people find out something is temporary, their behavior is different. Trying it on a temporary basis, I don't think would work.

In my position at the business school, I teach in an area involved with corporate planning, and I can think of no company who would make a significant capital expenditure without first simulating or attempting to find out how that would be affected by price changes or Government reactions. That is basically what Chairman Nassikas was indicating in response to the questions of Senator Kennedy. I think he is saying no studies will work, let's try it. I think that is erroneous. If, in fact, after adequate information is collected—hopefully, in the form of an independent gas survey—the information comes out that we do have a gas shortage, and possible alternatives do not seem likely to work, then I would not be opposed to deregulation. I have no policy position to take at this point.

Senator HART. Mr. Nash.

Mr. NASH. Thank you. On page 2 of your testimony, Professor Pifer, you say despite the natural gas reserve study which you worked on as an independent member, questions still remain as to the level of existing reserves and the impact of price on the future supply of gas. As the chairman testified, these were the two basic questions which the natural gas reserve study was designed to answer. Do you agree that the study was intended to answer these questions?

Professor PIFER. The gas reserve study was primarily intended to determine what proven reserves were as of December 31, 1970. It is in many ways a very important issue that we point out that it is in 1970 and that it is proven reserves.

The discussion that Senator Kennedy was having in the last minute, was regarding whether the reserves are proved. There is potentially a tremendous amount of gas; however, under current economics it may not be recoverable. So that, in my opinion, the study came out saying what the reserves were under those conditions, and yet it could have come out with much more information as to the impact of price.

It never dealt with the impact of price, other than the price in 1970. We don't know what happens to recovery ratios with a change in price.

Mr. Nash. Do you believe that the study provides there is an adequate basis to conclude there is a gas shortage?

Professor Pifer. Not in my opinion. There is nothing in the gas reserve study that deals with the impact of price.

Mr. Nash. I assume you are aware that within the last 3 years, the price of new gas has almost doubled—in some instances, tripled—and this has occurred progressively over time. Given your experience in corporate planning at Harvard Business School, do you think this type of action will encourage or discourage the additional expenditures for drilling?

Professor Pifer. I stated on page 1 of my prepared statement my response to that, and, if possible, I would like to read that:

> When evaluating public policy, it is often useful to attempt to understand the behavioral response of each interest group. Under the current levels of uncertainty in the natural gas industry, no one should be surprised that new additions to gas reserves have declined. During a period in which anticipated price increases exceed the general rate of inflation by a substantial amount, no rational businessman would commit a natural resource such as gas to a 20-year contract in which price escalation would be held to less than the general rate of inflation.

The issue is, in my opinion, that we have seen the price go from 20 cents to 45 cents in southern Louisiana. It is my understanding that they are now coming in with requests at 65 to 70 cents. There is no economic rationale for not withholding your reserves. Until there is some reduction in the uncertainty—and that does not have to be through deregulation—I suspect they are going to maintain their withholding of reserves.

Mr. Nash. Are you saying the piecemeal price increases granted have enhanced the decision of the companies to withhold gas supply?

Professor Pifer. I think that is correct. In addition, there is the fact that the escalation rates tied to a contract are not in any way tied to inflation. Yet, I suspect we are going to have inflation greater than 1.5 percent in the next few years.

Mr. Nash. As I understand, you agreed to serve on the national gas reserve study and national gas survey, sometime in April 1972. I would like to know what meetings you attended and whether you attended the initial meetings, and what work was done before you were made aware that there were meetings to attend?

Professor Pifer. The first meeting I attended was on September 12, 1972, for the national gas survey. There had been two meetings, one in December 1971, and another in April 1972. I was not invited to the one in April 1972. However, my name appeared as a member of the committee in the minutes of that meeting which I received yesterday. I never received minutes of that meeting or future meetings. Therefore, that study was well underway when I joined it.

In looking back through the minutes, the committee appeared to be undergoing a significant change and was expanded to bring in members of the public, and I assume other members of the industry. However, the committee was an advisory committee, and there was very little in the way of setting policy or actual analysis, so that the work was underway.

With respect to gas reserves study, I attended the first meeting of the first evaluation team, in May 1972, and we met every other month in preparation of the gas reserves study. Because of some political constraints, in the sense that statements had been made that we would survey one field in every State and survey every large field, the study was begun before the committee had met and also before any formal statement of what the reserve team procedure would be.

Mr. NASH. If you were on a statistical evaluation committee supposed to evaluate what the reserves in the United States are, who, if you know, did the work and laid out the procedures before your committee was constituted?

Professor PIFER. I believe that was done by the field team supervisor.

Mr. NASH. Who was that?

Professor PIFER. Lawrence Mangen.

Mr. NASH. Was it done solely by him?

Professor PIFER. There was also assistance by a member of our committee.

Mr. NASH. Was he an industry representative?

Professor PIFER. No; he was from the University of Colorado at Boulder. His assignment as part of the statistical evaluation team was to come up with a procedure.

Mr. NASH. Where was most of the work done—at the committee level or task force?

Professor PIFER. For the national gas survey?

Mr. NASH. Yes.

Professor PIFER. Clearly, on the task force level. The Technical Advisory Committee had only two meetings after my joining on April 28, 1972. One was in September and the final was this last March, in which we basically approved a report which in my opinion was inadequate, a summary of more than 1,100 pages of documentation by the task force. In my statement I go into the detail of it, but I believe 86 percent of the task forces were made up of members of the industry or Government, excluding the Federal Power Commission, and 60 percent of them were direct representatives of the industry, and five of six committees had chairmen and deputy chairmen who were also members of the industry.

Mr. NASH. On page 14 you refer to the inadequate amount of time afforded you to review survey reports. Can you tell me who prepared the reports?

Professor PIFER. I suspect that the task force chairmen and colleagues, whether from the committee or from his own company, did the bulk of the drafting of the report. I think the dissenting statements to the regulation and legislation task force specified that the majority of the comments on regulation and legislation were drafted by members of that committee who were with the industry. That committee was well represented by lawyers, counsel for several major oil companies.

Senator HART. That is another signal for a vote, Professor. If there is no objection, why don't you and Mr. Nash continue.

Mr. NASH. Thank you.

Dr. Pifer, can you state whether in any case the task force had a chairman who was not a representative of the petroleum industry?

Professor PIFER. I am sorry.

Mr. NASH. You referred to the chairmen of the various task forces responsible for the drafting. Who were the specific chairmen of the task forces?

Professor PIFER. You want their names?

Mr. NASH. If you can supply it for the record.

Professor PIFER. The overall head of the Technical Advisory Committee on Supply was Mr. Myron Wright, chairman of the board of Exxon. His vice chairman was Mr. William Slick, senior vice president of Exxon. On what I consider to be the two most important task forces were, first of all, natural gas supply, Mr. Ralph Garrett of Exxon, and his deputy was Mr. Worthy Wardack, also of Exxon. The other major one was regulation and legislation, and the task force director there was Mr. Earl Wright, vice president of Texaco, and Mr. Hammond, associate general counsel, was his deputy.

Mr. NASH. What role, if any, did independent members play on the task forces?

Professor PIFER. I can only speak for myself. Very much of the work was done at the task force level, so the members of those task forces could have been involved in the final report. I think it is interesting to note that in the regulation and legislation report, the two major dissenting opinions came from Dr. Schwartz of the FPC and Mr. Calfee of a public interest group. The reports were never in any way summarized adequately or prepared for the particular Technical Advisory Committee. I will point out most of the public interest members were on the Technical Advisory Committee. Approximately 33 percent of the committee was made up of members of academia, public interest groups, or corporate representatives not directly involved with the producing industry, so that if you look at the structure of the supply task force and advisory committee you will find that the people that are public interest group members were at the advisory level and not at the operating level, and you will find that the amount of time that we had to read the reports was extremely short.

Mr. NASH. Yes, you indicated you had about 1,100 pages to review. How much time was afforded to review those pages?

Professor PIFER. The reports started to come in to us March 22, 1973, and our final meeting was on May 22; we had less than 2 months. One of the main concerns I had, and I tried to voice, was the fact we did not have a summary of the, I think, somewhat humorous issue. In my dissenting opinion I tried to point out that the regulation and legislation task force report proposed deregulation. When I pointed that out to the technical director of the survey, he asked, "Where is that reference, I can't find it." I pointed out to him that it was on page 126 or 127. His comment was that he tried to find it, but he looked at only chapter 1, because that deals with the FPC. Members of that committee were made up of several general counsels from gas companies and were basically making statements of policy for the Technical Advisory Committee. The Technical Advisory Committee never received a summary of these.

Mr. NASH. Do you know whether the independent members of the various committees received copies of reports before they appeared at a committee meeting to take action respecting the reports?

Professor PIFER. I can only speak for myself. I did not receive a copy of the report until I arrived at the final meeting and having received that copy, I then received, before we discussed it, a revised copy. So I now had two copies at the meeting; I could compare them, which makes for a very good practice, trying to find out where the changes were.

Mr. Nash. I understand that natural gas reserves study was released May 17, 1973. Were you provided with a copy of it to make any comments before it was released?

Professor Pifer. No. I did receive a summary copy of what the statistical evaluation team report would be. I asked that certain changes be made. I was told it was too late to do that. I did finally receive a final copy of the Technical Gas Survey, from Dr. Root on the 3d of June. I was down in Washington on other business right after its placement in the Public Information Office, and I did receive a copy of it from there.

Mr. Nash. Let's get into the substance of the survey a little bit. The survey provided a total number of proved reserves. Did the survey include offshore reserves? Did the natural gas reserves study aggregate proved reserves include offshore reserves?

Professor Pifer. Only the offshore reserves, proved as of December 31, 1970. It included a reasonably small portion of what are now proved offshore reserves.

Mr. Nash. You think there were a significant number of reserves not included in the total?

Professor Pifer. I think that is true. Another point on that is that all of the fields offshore in the Federal domain, of southern Louisiana, were estimated by the USGS, and in fact, some of the data that I had pointed out were estimates in excess, not lower than the AGA estimates. Also, they sometimes were made on the basis of their own data, not on the basis of company data.

Mr. Nash. Let's turn to forecasts of offshore reserves made by companies. Were any forecasts of offshore reserves made by companies included in the report?

Professor Pifer. Mr. Nash, no forecasts of any reserves were published at all. There was a survey done, and in that survey there was general agreement among the task force to supply only estimated reserves in the inland regions.

There is a comment by the chairman of that committee in my statement that he would provide documents for offshore projections, if others would. And no one would. No reserve forecasts were made public, and none were made at all offshore.

Mr. Nash. As I remember, the initially approved work program included the specification that there would be forecasts made of future supply. Am I correct?

Professor Pifer. The work force had quite a lengthy and ambitious list of items. They also were to estimate prices, equipment expenditures, and production, through the year 1990. None of that was done

Mr. Nash. Dr. Pifer, with respect to forecasts provided to the study group, were any forecasts at all provided to the study group by gas producers?

Professor Pifer. Are we talking about the survey or study, Mr. Nash? In the NGS, forecasts were to be made by individuals and would not represent confidential information of that firm. Several firms declined to make any forecasts and instructed its employees not to make any forecasts. Some members of the committee did, in fact, make forecasts and I believe there were a substantial number of forecasts made. However, the task force decided in its final meeting not to publish these and to give them to the FPC. One of the final discussions was whether or not this should be made public, and after some discussion it was noted that these would be put in a public file.

Mr. Nash. To the best of your knowledge they exist in a public file now at the Power Commission?

Dr. Pifer. I assume so.

Mr. Nash. On page 17 of your testimony, Doctor, you indicate that there were inherent biases in the study. Could you elaborate on that, please?

Dr. Pifer. The first one that comes up is the significant economic changes to the industry since 1970. The reserves study published nothing other than the total reserves as of 1970. They also collected information on gas in place, and gas in place is differentiated from proven reserves by the recovery ratio assumed. Some assessment should have been made of the recovery ratio at both 20 and 45 cents because the recovery ratio would be significantly lower at 20 cents than 45. The second area was the fact we sampled the fields under 400 million cubic feet, and that sample was based upon a stratification based upon the AGA estimate of what the field size should be. This has some potential bias if, in fact, the AGA estimates are lower than what we would indicate. However, some of the data I presented in exhibit 3 of my statement point out that there was a tremendous amount of variability in the ratio the AGA said was in a given field and what the FPC said. A total of 22 out of 50 fields in the sample we undertook, or 44 percent of them, were off by a magnitude of 100 percent either above or below what the AGA said.

Mr. Nash. Up to how high did the variations go?

Professor Pifer. They went as low as nothing, where there was said to be gas, and up to eight times as much.

Mr. Nash. Were these variables within the 1-percent sample of 50 fields or within the 100-percent sample of 108 fields?

Professor Pifer. There appears to be less variation in these larger fields. What I was describing was only in the smaller fields.

Mr. Nash. If you were trying to find gas not reported by the AGA, would you expect it to be in the 108 fields which had reserves of 400 billion or more cubic feet or in the small fields?

Professor Pifer. Clearly, we would expect to find the variation in the small fields.

Mr. Nash. If you were a member of an evaluating team why did you choose a sample of 100 percent of the largest fields——

Professor Pifer. As I stated before, that was done before the committee was formed. And we were committed to the 100-percent sampling in the major fields. It is my understanding that the larger fields were completed about November of last year. This left very little time to prepare the overall estimate, and so we only sampled 50, or decided to sample 50, of the smaller fields.

Mr. Nash. We have just been advised that there is another vote on top of the vote the Senator just left for, and we can relax the rules to a certain extent. The chairman was hoping he would be back.

I suggest that we suspend. And after talking with General Counsel Charles Bangert, we suggest that we submit written questions to you, because the chairman has at least one more vote. That means another 20 or 25 minutes which would detain us at least until 6:30.

If it is agreeable to you, sir, we will suspend the hearing at this point and submit the written questions to you. Is that agreeable to you?

Professor PIFER. Yes.

[The following was received for the record. Testimony resumes on p. 183.]

TESTIMONY OF HOWARD WILLIAM PIFER III, GRADUATE SCHOOL OF BUSINESS ADMINISTRATION, HARVARD UNIVERSITY

I must indicate at the outset that my comments should not necessarily be taken as opposition in the long run to deregulation. It is my opinion, however, that the industry, through the National Gas Survey, has not provided sufficient information for legislators and/or regulators to adequately determine whether a natural gas shortage exists and, if it exists, whether the shortage will continue without radical departure to deregulation. Alternatives exist and should be evaluated.

When evaluating public policy, it is often useful to attempt to understand the behavioral response of each interest group. Under the current levels of uncertainty in the natural gas industry, no one should be surprised, that new additions to gas reserves have declined. During a period in which anticipated price increases exceed the general rate of inflation by a substantial amount, no rational businessman would commit a natural resource such as gas to a twenty year contract in which price escalation would be held to less than the general rate of inflation.

Yet that has been the historical record. When faced with uncertainty—uncertainty whether FPC regulation will continue, what future price levels and allowable rates of price escalation will be, what the duration of future delays in rate determination cases will be, etc.—it makes economic sense for the gas industry to withhold committing known gas supplies.

If the above is a reasonable representation of management behavior, then legislators and regulators should concentrate on methods of inducing the gas producers to increase the supply of natural gas. Reregulation need not be the sole alternative.

The question still remain as to the level of existing reserves and the impact of price on the future supply of natural gas. Unfortunately, adequate responses to these questions cannot, at this time, be made.

The hypothesis that inadequate basic information on both reserves and projected supplies of natural gas exists to properly evaluate the proposed deregulation legislation results from my involvement with both the National Gas Survey (NGS) and the National Gas Reserves Study (NGRS).

On April 28, 1972 I agreed to serve on both the Technical Advisory Committee for Supply (Supply-TAC) of the NGS and the Statistical Validation Team (SVT) of the NGRS, stating that my interest in serving on these committees stemmed both from the realization of the complex energy issues faced by regulatory agencies, in general, and from an understanding of the technical forecasting problems specifically associated with estimating natural resource reserves.

NATIONAL GAS SURVEY

Upon joining the Supply–TAC, I assumed its role to be (1) the supervision of the six Task Forces (TF) and their preparation of reports in accordance with the August 20, 1971 specification of a work program, and (2) the preparation of a summary report which would both summarize and integrate the findings detailed in the TF reports. In my opinion, the Supply–TAC has failed to adequately respond to its assignment.

At a time when the structure of the U.S. natural gas industry should be under serious reevaluation, the learned judgment of recognized experts should be a valuable input to the legislative and regulatory process. In my opinion, the Supply-TAC report does not adequately meet the criterion of an independent evaluation of the U.S. natural gas industry due to its failure (a) to require accountability of its task forces, (b) to properly focus attention upon conclusions reached by its task forces, and (c) to provide a forum for adequate discussion of the key policy issues raised.

The following comments expand upon my dissenting opinion to the Supply-TAC Summary Report (Attachment A) and incorporate additional comments regarding the NGRS.

Prior to providing details to support the above-mentioned concerns I would like to briefly describe the structure of the Supply-TAC and its six TFs. I believe that, in part, this structure precludes an independent evaluation of the U.S. natural gas producing industry.

The Supply-TAC is quick to point out that it "represents leaders from the producing industry, academia, government, consumer-interest organizations, and other groups." A summary of the membership of the Supply-TAC and its TFs tends to negate the potential impact of members not representing either the industry or government (see Exhibit 1). For example, two thirds of the TAC members were affiliated directly or indirectly with the producing industry and government (excluding FPC representatives). The remainder represented organizations and institutions with no direct affiliation with the gas producing industry.

In order to meet the goals of the NGS, the Supply-TAC recommended the establishment of six subordinate TFs to conduct its major investigations. Unfortunately, these TFs were primarily manned by industry and government representatives. Eighty-six percent of the combined TF membership were industry related or government employees and only fourteen percent represented non-affiliated organizations and institutions. In addition, nearly sixty percent of all TF members were direct representatives of the producing industry with all TFs chaired by industry members with the exception of the Synthetic Gas-Coal TF. Thus, the operational segment of the NGS was heavily oriented toward the producing industry. This issue becomes exceedingly important when one attempts to evaluate the conclusions reached by the Supply-TAC.

(a) *To require accountability of its task forces.*—In establishing the Task Force-Supply, the Supply-TAC specified a work program in which the TF-Supply was asked to:

- (a) develop a procedure for verifying gas reserves data,
- (b) develop historical data on exploration and development activities and expenditures, reserve additions, production and deliverability,
- (c) define the relationship between oil and gas,
- (d) project future gas reserves by area,
- (e) project future industry gas production volumes and deliverability by areas,
- (f) estimate the average price of all gas being sold each year,
- (g) project overland imports from Canada and Mexico,
- (h) project revenue, capital requirements, operating costs, and net capital requirements for the exploration production sector of the industry, and
- (i) evaluate factors affecting natural gas reserve additions, production and deliverability including:
  - (1) government regulations
  - (2) fiscal policies
  - (3) prices and costs
  - (4) field compression
  - (5) federal and state leasing policies
  - (6) environmental considerations

The detailed list of objectives was specified in the August 20, 1971 Work Program—more than 20 months ago—and is provided as Attachment B.

The first task was accomplished through the National Gas Reserves Study (NGRS), a topic which I will discuss in detail later. With that exception, the TF-Supply in my opinion accomplished nothing!

The final report of the TF-Supply was distributed to members of the TAC on April 26, 1973 and did not include a supply forecast as detailed in the work program. Instead, the TF summarized studies by the Potential Gas Committee and the National Petroleum Council and indicated where these documents could be obtained. I found this response more than one and one-half years after its initial assignment totally inadequate.

From the outset, the TF-Supply sought new approaches to project future gas supplies and for this they should be commended. Statements to the effect that a compilation of existing studies would not be adequate sounded appropriate amidst promises of innovation. Unfortunately, the TF-Supply concluded, after completing a forecasting procedure which resulted in regional inland gas supply forecasts under varying price and offshore leasing assumptions:

"Without specified uniform assumptions or knowledge of the different assumptions which may have been used by individual forecasters, the Task Force is of a consensus that it is not in a position to either endorse or comment on the various regional forecasts or the consolidation of them for a total inland U.S. forecast. For these reasons, this report does not include a forecast of supply."

A historical perspective is required to properly evaluate the merits of this conclusion.

General procedures for preparing gas supply projections were developed by the TF-Supply and approved by the Supply-TAC at its September 12, 1972 meeting. Upon approval, specific instructions were distributed to TF members and regional projections of future gas supplies and their related price and offshore leasing assumptions were forwarded to the Technical Director, National Gas Survey. These instructions make explicit that: "Each Task Force member should make his forecast entirely independently of any other Task Force member."

Why, then, after the fact, did the TF-Supply conclude that it was not in a position to either endorse or comment on the various regional forecasts? Why did the Supply-TAC accept the TF report which did not (a) project future gas reserves, (b) project future gas production volumes, (c) develop a technique for estimating the future average price of natural gas, or (d) project revenue, operating costs and net capital requirements for the exploration-production component of the U.S. natural gas industry?

Perhaps the answer to the first question is reflected in the TF-Supply statement:

"Individual forecasters were left to their own best opinion on several significant assumptive items such as (1) future trends in federal policies regarding taxes and oil imports, (2) industry capital limitations, (3) regional variations in gas price with respect to the national average, (4) future liquid hydrocarbon prices, and (5) technological changes."

Yet, before the fact, the TF-Supply clearly specified in its instructions that each forecaster would be responsible for making his own assumptions regarding these issues. To fail to publish the regional gas supply forecasts after clearly specifying the procedure can only suggest, in my opinion, compelling political reasons for nondisclosure.

Several reasons might be given for the failure of this TF to complete its task. First, one should investigate the TAC/TF concept to determine whether such assignments can effectively be completed within the existing organizational structure. Without a staff assigned directly to the TF which would be responsible for implementing its work program, the TF is hindered by a committee of advisors, none of whom are oriented toward the detailed analysis required. In addition, the composition of the committee and its lack of financial resources to procure outside analytic services severely limit the TF's ability to overcome the political implications of any policy statement it might make.

I am not alone in questioning the current organizational structure. Professor Harbaugh of Stanford in a letter referencing the Supply-TAC Summary report concluded:

"In preparing the final summary report of the Supply TAC of the National Gas Survey, I suggest that a new study be recommended to attempt to forecast future gas supplies. It is unfortunate that the Task Force for Natural Gas Supply was unable to carry out its commission with respect to preparing forecasts of future gas supplies on a nation-wide basis. If anti-trust considerations would continue to preclude such a study by a committee drawn from industry, perhaps such a study could be carrier out by an independent research organization."

Second, one should investigate the legal constraints imposed by the FPC. The TF-Supply specifically noted in the minutes of its January 16, 1973 meeting that the responses of TF members to the gas supply forecasting procedure were constrained by the confidentiality of data as well as possible anti-trust implications. While the FPC legal rulings often interfered with full industry disclosure, I have not been convinced that resolution of these legal issues would have eliminated an implicit unwillingness by industry members to face up to the task required. Let me be specific by examples:

(1) On page 3 of its final report, the TF concludes: "There was some opinion within the TF that it is not possible to forecast the future response of gas supplies to price with enough accuracy to justify the effort."

(2) On page 4 of the minutes of the July 12, 1972 meeting, it states: "Some of the people preparing the forecasts indicated that if it is necessary that all workpapers or source documents be delivered to and maintained in the FPC's files, then the companies represented would base their forecasts on public information only . . . (it was) suggested (that) the TF might adapt another forecast such as that prepared by the National Petroleum Council to meet its needs."

(3) On page 4 of the minutes of the January 16, 1973 meeting, it states: "(The TF Chairman) indicated that his company prepared offshore estimates for Region 6A (the Gulf Coast Offshore Region) but were reluctant to submit them because all other companies failed to respond. (His Company) would still submit offshore projections if other TF members would volunteer to contribute forecasts of future gas supplies. . . . Another suggestion that elicited considerable discussion was the possible adoption of the NPC forecasts. . . . Others suggested that the NGS should refer to the NPC report and that the TF should not submit forecasts for any of the areas. . . . It was further suggested that consideration be given to an attempt to secure clearance from the Justice Department which would permit a collective forecast of offshore supplies by industry representatives on the TF. There were no responses to this suggestion."

While these excerpts are but a few that could be traced to the TF-Supply, I believe they indicate a basic unwillingness to come to grips with a difficult task. It is quite likely that the TF-Supply set out with good intentions and was unable to satisfactorily complete the project. If this is so, then a thorough investigation of the TAC/TF process should be undertaken in order to provide legislators and regulators in the future with the valuable input of industry representatives. Unfortunately, the TAC's acceptance of this inadequate report undermines the credibility of the entire report.

The minutes of the TF-Supply indicate that serious objections to the forecasting procedure arose approximately one year ago. While the forecasting procedure was discussed at the September 12, 1972 TAC-Supply meeting, the discussion was limited to acceptance or rejection of the proposed method. No other TAC-Supply meetings were held until May 22, 1972 where the final report was discussed. During this period, Supply-TAC members who were not on the TF-Supply were unaware of the problems that existed within the TF and, thus, were unable to provide alternatives to the final outcome (i.e., no supply forecasts).

Without a nationwide forecast of future gas supplies under varying assumptions as specified in the work program, the NGS provides no quantitative information to assist in the valuation of proposed legislation and/or regulation.

(b) *To properly focus attention upon conclusions reached by its task forces.*—A major responsibility of the Supply-TAC was to provide a summary which would highlight the major findings of the TFs and focus attention on the conclusions reached by the TFs. Unfortunately, the Supply-TAC Summary Report as presented at the May 22, 1973 meeting failed to capture the essence of the TFs' conclusions, leaving the uninformed reader the task of reviewing the support documents to determine the conclusions of the NGS. This problem was most notable in the TF-Regulation and Legislation report.

There is little doubt that the TF-Regulation and Legislation was thorough in its deliberations. Even its vocal critic, Dr. David S. Schwartz, began his minority opinion by stating: "There is a great deal of factual and analytical material in the majority report of the Task Force." The three hundred page document does not provide either an introductory or concluding section; instead, it spreads its conclusions throughout the exhaustive report. Let me try to state those conclusions which are essential to any discussion of future regulation and legislation:

(1) On pages 87 and 88 of its report, the TF-Regulation and Legislation concludes: "This trend (i.e. demand exceeding supply) has accelerated and now calls for new approaches for gas pricing which will allow this premium fuel to attain its market value . . . The supply-demand imbalance necessitates an approach which would allow natural gas to reach its commodity value in a competitive market."

(2) On page 127, the TF-Regulation and Legislation concludes: "Deregulation of natural gas producers is necessary to help correct the supply-demand imbalance."

Why were these critical conclusions buried in the TF report? Why were they not emphasized in the TAC summary?

Fortunately, two dissenting opinions raised these issues to the surface, so that the Supply-TAC Summary Report mentions, in a casual manner.

"This report had two dissenting opinions on the conclusions that producer regulation has been unsuccessful and that deregulation of natural gas producers is necessary to correct the supply-demand imbalance. The dissenting opinions state that effective consumer protection necessitates regulation from the wellhead to the burner top and deregulation of natural gas prices could lead to spiralling wellhead prices which could reach unreasonably high levels."

I do not find it surprising that the TF proposes deregulation as the required legislation, a general recommendation actively sought by the industry for more than two decades. What I do find surprising, however, is the manner in which it was proposed.

The first chapter of the TF-Regulation and Legislation report concentrates upon the regulatory powers of the Federal Power Commission and concludes that "an approach which would allow natural gas to reach its commodity value in a competitive market" is necessary. This conclusion is based on the premise that past regulatory actions have not worked and have resulted in a serious imbalance between supply and demand. No quantitative support is given to support this proposition.

Then, in Chapter Three which was devoted to a summary of legislative proposals through the 92nd Congress, the task force concludes:

"The extent to which natural gas sold in interstate commerce should be regulated has been considered by Congress on many occasions since the mid-1930's. However, only the Natural Gas Act and subsequent amendments thereto have been passed by Congress and enacted into law. More recently, the present nationwide shortage of natural gas has caused Congress' attention to be focused on the supply and demand imbalance. A variety of bills have been introduced which address themselves to this problem.

"It must be concluded that Congress' inaction in this field, coupled, until recently, with the lack of any prospect for meaningful legislative relief, has had an adverse effect on supply-demand relationships. Congress is in a better position to take fundamental remedial action directed to the supply-demand imbalance than is the Commission whose authority is limited by statute and court decisions, and whose actions continue to be subject to challenge in the courts. Deregulation of natural gas producers is necessary to help correct the supply-demand imbalance."

These conclusions, especially the final sentence, are unsupported by factual information and underscore the need for balanced representation not only on the TAC but also the TFs.

It should be noted that the TF-Regulation and Legislation was dominated by industry representatives. Of the fourteen non-FPC members, ten represented industry, two were government representatives and two were affiliated with public interest groups. Although the TF-Regulation and Legislation report received several short opinions, the two substantive minority reports by Dr. David S. Schwartz (Office of Economics, Federal Power Commission) and David W. Calfee (Attorney at Law, Public Interest Research Group), both members of the TF, openly question the industry orientation of the report. I find it unfortunate that the composition of this task force was permitted to be so blatantly biased toward the industry.

(c) *To provide a forum for adequate discussion of the key policy issues raised*—The Natural Gas Survey has been in process for more than two years with less than two months allocated to TAC members for review and comment upon six lengthy TF reports. In the last year, the Supply-TAC has convened only twice, the aforementioned September 12, 1972 and May 22, 1973 meetings. With respect to integrative efforts, the committee members were limited to approximately three hours to collectively review the Supply-TAC Summary Report with ten days allotted for individual written comments and no time provided for review of other committee member's opinions. While I appreciate the urgency associated with energy issues, it is my opinion that the Supply-TAC was hindered in its ability to wrestle with some difficult policy issues; the option being to minimize any integrating efforts of the committees.

Once again, the structure of the TAC/TF organization can be openly questioned. With an abundance of advisors and no operational staff to assist in the information retrieval and report generation phases of the NGS, the TF chairmen have little option but to depend upon their colleagues (however defined) to assist. Those that are most willing to volunteer their services generally not only have a vested interest in the final outcome, but also a similar perspective as the TF chairmen. When under time pressure to produce a document for public dissemination, a rational man would not actively seek individuals to assist in drafting a report who would oppose the general consensus of the group and, therefore, prolong deliberations.

While the individual TFs were perhaps constrained by deadlines, the Supply-TAC was under extreme pressure to approve a summary report at its May 22, 1973 meeting. Exhibit 2 highlights the work schedule of the members of the Supply-TAC.

Beginning on March 22, 1973 committee members were mailed individual copies of the TF reports for review prior to the final Supply-TAC meeting. These reports totaled more than 1100 pages and were not adequately summarized. Four days before the Supply-TAC meeting, a summary report was distributed and it was noted that this document, along with the final TF presentations, would be the major order of business.

This timing placed severe constraints upon committee members who were not actively supporting a prior position since an understanding of the overall implications required an inordinate amount of preparation. This time commitment could have been significantly reduced if (a) public interest members had confidence in the independence of the TF reports, and (b) summaries of the individual reports had been provided. Without these aids, the ability of the committee to openly discuss the conclusions reached by the TFs and summarized in the Supply-TAC Summary Report was severely limited. Discussion was further hindered at the meeting by the distribution of a revised Supply-TAC Summary Report which required committee members to compare the two copies for substantive changes.

After witnessing the May 22, 1973 meeting and reading the summary report, I submitted a dissenting opinion on May 31, 1973 which was hand-carried to Washington, D.C. to meet the June 1 deadline for comments. On June 5, 1973 the Technical Director of the NGS informed committee members that the due date had been extended until June 22, 1973 to permit members an opportunity to submit comments after reviewing the final copy of the summary report and to permit reactions to written comments submitted by other members. On June 11, 1973 the Technical Director distributed copies of three letters (mine included) which were in response to the original June 1 deadline.

Since that time, I have not received additional communications. Unfortunately, the process of specifying an unreasonably short deadline and then, after the fact, extending the deadline does not elicit the same response level that an initial announcement of a one month deadline would have.

National Gas Reserves Study

On May 17, 1973 the Federal Power Commission released the NGRS and noted that:

"An independent government study carried out under the direction of the Federal Power Commission shows that the nation's proven recoverable natural gas reserves totaled 261.6 trillion cubic feet at the end of 1970, nearly 10 percent below the American Gas Association's estimates for that date."

The FPC staff report concluded:

"(This Study) is a highly significant first step, but still just that. It is imperative that the United States, so dependent upon its own fossil fuel resources, have a continuing program to provide government and industry planners with a comprehensive, accurate and credible inventory of our proven fossil fuel resources. The primary goal of this program was to establish, on a consistent basis, a conclusive estimate of the proven reserves of natural gas available under existing economic and technical conditions. That goal has been achieved. However, much more information is needed to complete the evaluation. A similar appraisal of the Nation's oil reserves should be undertaken; deliverability studies to determine optimum rates of production should be made; further economic studies should be conducted to assess the response of resource base development to economic stimuli; and a combined state and federal effort to improve the energy data gathering, storage and retrieval effort should be initiated."

I heartily agree that the NGRS is a significant first step; but one which leaves many questions unanswered and raises many doubts about the data collection process employed. Having been associated with the NGRS as a member of the SVT, I must preface my remarks by publicly stating that the FPC staff, to the best of my knowledge, fulfilled its responsibility in a professional manner. Unfortunately, there were inherent biases in the study which, when coupled with the limited amount of information reported, severely restricts the value of this, the first NGRS. In fact, the staff recommendation to immediately update the study so that an independent estimate of the nation's proven gas reserves are available for the year-end 1972 should be a prerequisite for legislative action. In addition, the information collected and made available to the public should be greatly expanded.

The data collection and information reporting procedures employed within the NGRS maintained the confidentiality of company records. The details of these procedures are outlined in the NGRS and I will only comment on key areas of concern.

(1) reserve team estimation of reserves—The process of estimating reserves can be segmented into four components: (a) geological samples, (b) primary raw data which is the result of laboratory tests using the geological samples, (c) gas-in-place which is determined by well-specified empirical relationships using the primary raw data, and (d) recoverable reserves which are determined by applying a recovery ratio to the gas-in-place measurement. This process is depicted in Figure 1.

At the May 10, 1972 meeting of the SVT, the field team Supervisor described the procedure being utilized by the reserve teams to estimate gas reserves and outlined three areas where subjectivity was employed: (a) interpreting geological test data (for example, electrical well surveys, core analysis, specific gravity, formation temperature, reservoir pressure, etc.), (b) calculating gas-in-place, and (c) determining recovery efficiency. In accordance with instructions from the field team Supervisor, reserve teams perform two types of reserve estimates—in-depth analysis which begin with the raw data, and evaluations which employ company-developed parameters to calculate gas-in-place. At that time, the in-depth procedures were generally being used. The field team Supervisor noted that reserve team members had expressed concern that the current procedures did not provide sufficient time to adequately estimate gas reserves. Unfortunately, the final report does not describe the frequency with which each procedure was employed. If time pressures resulted in an increasing number of evaluations, the independence of the data collection procedures could be suspect.

(2) reserve team reporting to supervisor—After completing the analysis of all reservoirs within a given gas field, the reserve team leader phoned the field team supervisor and reported both associated and non-associated reserve estimates on a reservoir-by-reservoir basis while in the presence of a company representative. The NGRS summarized the procedure as follows:

"The field team Supervisor, compared the independent field reserve estimates with reserves estimates from the A.G.A. At his discretion, he could call for a recheck if the work of a reserve team or a re-examination of the data by a reserve team of his choice. A final reserve estimate for each field was transmitted to the Independent Accounting Agent."

Minutes of the May 10, 1972 Meeting of the Statistical Validation Team record the following description of the process and the reaction of SVT members:

"To determine the magnitude of errors within the reserve team estimation procedure, Mr. Miesch (USGS) suggested that for a sample of gas fields two reserve teams be independently sent to estimate reserves. (The Supervisor) noted that the reserve teams notify him of the estimated reserves within a field by telephone. If these estimates differ significantly from AGA reserve estimates, the reserve team must check their calculations. Other validation team members pointed out that this was not necessarily equivalent to the independent estimates suggested by Mr. Miesch."

Thus, the above comments suggest that the field team supervisor received the reserve estimates by phone and, after comparing them with AGA estimates, aggregated the reservoir-by-reservoir estimates and transmitted the field estimate to the Independent Accounting Agent. After receiving the Supervisor's acceptance of the field reserves estimate, the field teams collected their working papers and placed them in a sealed envelope for maintenance by the FPC.

While this procedure painstakingly guarded the confidentiality of records, it limited subsequent analysis of reserves since the only individual who has seen the field-by-field reserve estimates is the field team Supervisor.

(3) analysis of reserve estimates—In a memorandum to SVT members dated July 27, 1972 I proposed a statistical procedure based upon regression analysis which could be employed to explain difference between the NGRS and AGA reserve estimates. While the classical analysis of variance technique used within the NGRS report eliminated any dependence upon the AGA reserve estimate, the regression procedure provided additional information which could be extremely useful in describing the sampling procedures and the reliability of the sample.

Although this procedure was not included in the NGRS report, the SVT concluded:

". . . some experimental work was done using a regression model which makes it possible to examine the ratio of A.G.A. reported field reserves to field team reported reserves, as affected by size, field discovery data, geographical region, reservoir type, team and other pertinent factors . . . The regression analysis method will be examined further and will be the subject of a future report by the Statistical Validation Team."

In developing the data base for the above-mentioned procedure, the field team Supervisor provided Mr. William Munroe of the FPC with, among other data, the ratio of NGRS reserves estimate to AGA reserves estimate for each gas field included in the study. In this manner, the actual estimates of reserves remained confidential.

Preliminary analysis of these data has been conducted by Mr. Munroe. At an April 4 meeting at the FPC, I requested the base data to continue the analysis. As a first step, I attempted to summarize the data as shown in Exhibit 3.

Thus, while the NGRS reported associated and nonassociated gas reserves of 228.5 TCF (a ratio of NGRS reserves estimate to AGA reserves estimate of .9067), the variability among individual field estimates (once again, as measured by the ratio of NGRS to AGA reserves estimates) is significant. For example, 33 fields out of the 159 observations resulted in a difference between the FPC (NGRS) and AGA reserves estimate of more than 100 percent (i.e., ratios of 0.50 or less than 2.00 or more)! This compares with only 47 fields which were within ±10 percent. These significant differences should be reexamined.

As a second step in the analysis, I attempted to determine whether gross differences existed among estimating teams and whether significant differences existed between the sample of 50 fields with less than 400 BCF and the complete population of fields with more than 400 BCF. The results are summarized in Exhibit 4. As indicated in the previous exhibit, the sample of smaller fields showed significantly greater variations between the NGRS and AGA estimates. Perhaps the most surprising result is the significant difference between the average ratio for those fields estimated by the FPC [.8702] and those reported by the USGS [1.0507] and U.S. Navy [1.0566] reserve teams. These preliminary results indicate that the USGS and U.S. Navy estimates that the proved reserves exceed the AGA estimates by more than five percent; whereas, the FPC teams found that the reserves in these large fields were 13 percent below the AGA estimates. It should be noted that the USGS concentrated on those fields in the Federal Domain, Offshore Louisiana, where they had developed their own basic raw data and, therefore, did not rely on company-supplied information. In addition, the U.S. Navy concentrated on Alaskan fields. Both of these locations are areas in which significant new additions to reserves are expected. In my opinion, these surprisiag differences among reserve teams should be investigated further.

(4) information released to public—Perhaps the most disconcerting aspect of the NGRS was the lack of data released to the public. The sum total of useful quantifiable information can be summarized in the form of Exhibit 5. Under the assumption that this direct comparison might compromise the independence of the study, the NGRS and AGA data were compiled in separate tables (respectively, Table 5 and Table 2 of the SVT report). Little can be gleaned from this information that would be useful to legislators and regulators other than the fact that the overall NGRS estimate of proved recoverable reserves as of December 31, 1970 under 1970 economic conditions were 90.6 percent of the AGA reported estimate of proved recoverable reserves.

Many more questions could be asked by legislators and regulators—and should be asked and subsequently answered—as part of the evaluation of legislative proposals for modifications in the regulation of the U.S. natural gas industry. For example, three of the most important would be:

(a) What was the total estimated gas-in-place and the average recovery ratio used within the NGRS?

(b) What is the implied relationship of the recovery ratio to an increase in the wellhead price of natural gas?

(c) Were there significant regional differences between the NGRS and AGA reserve estimates? If so, where?

Responses to these questions could assist in the evaluation of the impact of price upon gas supply. Unfortunately, this concept was not included in the NGRS even though the information was gathered to determine the proved recoverable reserves as previously described. This shortcoming, coupled with the failure of the TF-Supply to publish a forecast of future supply, severely limits the public policy value of both the NGS and the NGRS.

National concern over energy issues should not compel legislators and/or regulators to seek radical alternatives. Additional information should be collected and analyzed before recommending alternative legislation to the current Natural Gas Act. This need not imply that existing regulation should not be modified to reduce present uncertainty.

Figure 1

Schematic Representation of Reserve Estimation Procedure

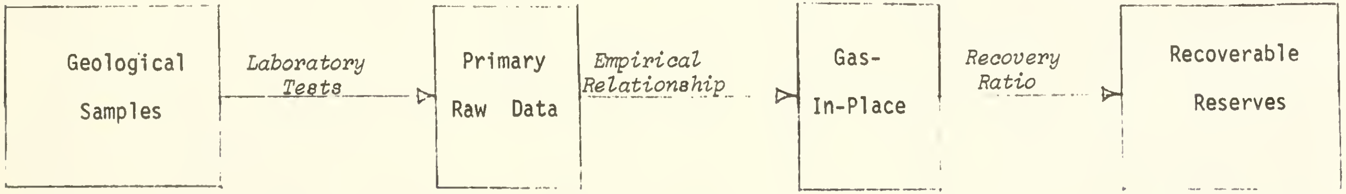
Geological Samples
Laboratory Tests
Primary Raw Data
Empirical Relationship
Gas-In-Place
Recovery Ratio
Recoverable Reserves

EXHIBIT 1

SUPPLY COMMITTEES MEMBERSHIP BY AFFILIATION (EXCLUDING FPC REPRESENTATIVES)

[In percent]

Affiliation of members (percentage distribution)	Technical advisory committee	Task forces (combined)
Producing industry	40.7	59.8
Government	14.8	18.7
Corporate (related to producing industry)	11.1	7.5
Subtotal	66.7	86.0
Corporate (other)	7.4	4.7
Academic institution	22.2	7.5
Public interest group	3.7	1.9
	3.7	1.9
Subtotal	33.3	14.0
Total	100.0	100

EXHIBIT 2

1973 WORK SCHEDULE FOR SUPPLY-TAC

TF report	Distribution date	Length (pages)
Regulation and legislation	Mar. 22	304
Reformer gas	Apr. 6	85
Natural gas technoogy	Apr. 9	296
Natural gas supply	Apr. 26	71
Liquified natural gas (LNG)	May 7	181
Synthetic gas—coal	May 11	172
Total		1,109
Supply-TAC summary report[1]	May 18	[2] 15
Final meeting of Supply-TAC	May 22	

[1] It should be noted that the Supply-TAC summary report was not distributed to all members prior to the May 22, 1973 meeting.

[2] Pages plus attachments.

EXHIBIT 3

DISTRIBUTION OF NATURAL GAS RESERVE ESTIMATES

Ratio of FPC estimate to AGA estimate	Sample of fields less than 400 BCF		Fields with 400 BCF or more	
	Number of fields	Percentage	Number of fields	Percentage
Less than 0.50	18	36	11	10.1
0.50 plus to 0.90	10	20	39	35.8
0.90 plus to 1.10	10	20	37	33.9
1.10 plus to 2.00	8	16	22	20.2
More than 2.00	4	8		
	50	100	[1] 109	100

[1] 2 fields were each estimated by 2 different reserve teams; 1 field was misclassified and had no associated or nonassociated reserves (only dissolved).

EXHIBIT 4

RATIO OF FPC TO AGA RESERVES ESTIMATES

	Statistical measures	
	Means	Standard error
Sample of 50 fields with less than 400 BCF	.9871	.1929
109 fields [1] with 400 BCF or more	.9001	.0319
91 fields estimated by FPC	.8702	.0350
16 fields estimated by USGS teams	1.0507	.0738
2 fields estimated by U.S. Navy	1.0566	.2927

[1] 2 fields were each estimated by 2 different reserve teams; 1 field was misclassified and had no associated or non-associated reserves (only dissolved).

EXHIBIT 5

ESTIMATES OF PROVED RECOVERABLE GAS RESERVE

[All volumes in billions of cubic feet]

Size of field	Number of fields	NGRS estimate		AGA estimate	
		Average field size	Total reserve	Average field size	Total reserve
$0 \leq$ Fields ≤ 1	1,879	2.1	3,910	0.4	723
$1 <$ Field ≤ 5	1,822	1.3	2,412	2.5	4,546
$5 <$ Filed ≤ 10	719	5.7	4,101	7.2	5,194
$10 <$ Field ≤ 50	1,200	15.0	18,019	22.5	27,048
$50 <$ Field ≤ 200	509	82.0	41,723	96.6	49,155
$200 <$ Field ≤ 400	121	280.1	33,891	276.0	33,396
$400 <$ Field	108	1,152.1	124,429	1,223.2	132,109
Total	6,358		228,484		252,170

ATTACHMENT A

HARVARD UNIVERSITY,
GRADUATE SCHOOL OF BUSINESS ADMINISTRATION,
GEORGE F. BAKER FOUNDATION,
Boston, Mass., May 31, 1973.

DR. PAUL J. ROOT,
Technical Director, National Gas Survey, Federal Power Commission,
Washington, D.C.

DEAR PAUL: After witnessing the May 22, 1973 meeting of the Technical Advisory Committee-Supply and reading its Summary Report, I would like to comment upon both subjects from the perspective of a public interest member of that Committee.

Upon joining the Technical Advisory Committee-Supply (TAC) on May 10, 1972 I assumed its role to be (1) the supervision of the six Task Forces (TF) and their preparation of reports in accordance with the August 20, 1971 specification of a work program and (2) the preparation of a summary report which would both summarize and integrate the findings detailed in the TF reports. In my opinion, the TAC-Supply has failed to adequately respond to its assignment.

Perhaps the most disappointing element has been the failure of the TAC to hold individual Task Forces responsible to their assignments as clearly specified in the August 20, 1971 memorandum. Quite frequently committee members suggested that Federal Power Commission "constraints" interfered with the committee's ability to effectively complete its task. While the FPC legal rulings often interfered with full industry disclosure, I have not been convinced that resolution of these legal issues would have eliminated an implicit unwillingness by industry members to face up to the task required. Let me be specific by providing examples.

EXAMPLE I

From the outset, the Technical Advisory Task Force-Supply sought new approaches to project future gas supplies and for this they should be commended. Statements to the effect that a compilation of existing studies would not be adequate sounded appropriate amidst promises of innovation. Unfortunately, the TF-Supply concluded, after completing a forecasting procedure which resulted in a significant number of regional inland gas supply forecasts under varying price and offshore leasing assumptions:

"Without specified uniform assumptions or knowledge of the different assumptions which may have been used by individual forecasters, the Task Force is of a consensus that it is not in a position to either endorse or comment on the various regional forecasts or the consolidation of them for a total inland U.S. forecast. For these reasons, this report does not include a forecast of supply."

A historical perspective is required to properly evaluate the merits of this conclusion.

General procedures for preparing gas supply projections were developed by the TF-Supply and approved by the TAC-Supply at its September 12, 1972 meeting. Upon approval, specific instructions were distributed to TF members and 120 regional projections of future gas supplies and their related price and offshore leasing assumptions were forwarded to the Technical Director, National Gas Survey. These instructions make explicit that: "Each Task Force member should make his forecast entirely independently of any other Task Force member."

Why then, after the fact, did the TF-Supply conclude that it was not in a position to either endorse or comment on the various regional forecasts? Why did the TAC-Supply accept the TF report which did not (a) project future gas reserves, (b) project future gas production volumes, (c) develop a technique for estimating the future average price of natural gas, or (d) project revenue operating costs and net capital requirements for the exploration-production component of the U.S. Natural gas industry?

Perhaps the answer to the first question is reflected in the TF-Supply statement:

"Individual forecasters were left to their own best opinion on several significant assumptive items such as (1) future trends in federal policies regarding taxes and oil imports, (2) industry capital limitations, (3) regional variations in gas price with respect to the national average, (4) future liquid hydrocarbon prices, and (5) technological changes."

Yet, before the fact, the TF-Supply clearly specified in its instructions that each forecaster would be responsible for making his own assumptions regarding these issues.

To fail to publish the regional gas supply forecasts after clearly specifying the procedure can only suggest, in my opinion, compelling political reasons for nondisclosure.

Example 11

There is little doubt that the Supply-Technical Advisory Task Force-Regulation and Legislation was thorough in its deliberations. Even its vocal critic, Dr. David S. Schwartz, began his minority opinion by stating: "There is a great deal of factual and analytical material in the majority report of the Task Force." The three hundred page document does not provide either an introductory or concluding section; instead, it spreads its conclusions throughout the exhaustive report. Unfortunately, the TAC-Supply Summary report as presented at the May 22, 1973 meeting failed to capture the essence of the TF's conclusions. Let me try to state those conclusions which are essential to any discussion of future regulation and legislation:

(1) On pages 87 and 88 of its report, the TF-Regulation and Legislation concludes:

"This trend (i.e., demand exceeding supply) has accelerated and now calls for new approaches for gas pricing which will allow this premium fuel to attain its market value . . . The supply demand imbalance necessitates an approach which would allow natural gas to reach its commodity value in a competitive market."

(2) On page 127, the TF-Regulation and Legislation concludes:

"Deregulation of natural gas producers is necessary to help correct the supply demand imbalance."

Why were these critical conclusions buried in the TF Report? Why were they not emphasized in the TAC summary report?

Fortunately, two dissenting opinions raised these issues to the surface, so that the TAC Summary Report mentions, in a casual manner:

"This report had two dissenting opinions on the conclusions that producer regulation has been unsuccessful and that deregulation of natural gas producers is necessary to correct the supply-demand imbalance. The dissenting opinions state that effective consumer protection necessitates regulation from the wellhead to the burner tip and deregulation of natural gas prices could lead to spiralling wellhead prices which could reach unreasonably high levels."

At a time when the structure of the U.S. natural gas industry should be under serious reevaluation, the learned judgement of recognized experts should be a valuable input to the legislative and regulatory process. In my opinion, the TAC-Supply report does not adequately meet the criterion of an independent evaluation of the U.S. natural gas industry due to its failure (a) to require accountability of its task forces, (b) to properly focus attention upon conclusions reached by its task forces, and (c) to provide a forum for adequate discussion of the key policy issues raised. While the TAC-Supply is quick to point out that it "represents leaders from the producing industry, academia, government, consumer-interest organizations," the overwhelming majority of members are from the producing industry and/or have been closely associated with the industry in the past.

The Natural Gas Survey has been in process for more than two years with less than one month allocated to TAC members for review and comment upon six lengthy TF reports. In the last year, the TAC-Supply has convened only twice, the aforementioned September 12, 1972 and May 22, 1973 meetings. With respect to integrative efforts, the committee members were limited to approximately three hours to collectively review the TAC-Supply Summary Report with ten days allotted for individual written comments and no time provided for review of other committee members' opinions. While I appreciate the urgency associated with energy issues, it is my opinion that the TAC-Supply was hindered in its ability, to wrestle with some difficult policy issues; the option being to minimize any integrating efforts of the committees.

These are unfortunate conclusions. I would have hoped that the TAC-Supply could have faced these issues squarely and provided information for the analysis of future industry policies. Instead, the committee decided to avoid its responsibilities, leaving the decision-makers and the public without adequate information to properly evaluate the radical alternatives under consideration. In this environment the political process, rightly or wrongly, holds the day.

Sincerely yours,

HOWARD W. PIFER.

ATTACHMENT B

NATIONAL GAS SURVEY—SUPPLY TECHNICAL ADVISORY COMMITTEE—WORK PROGRAM

All data items will be developed on a quantity-per-annum basis. Annual historic quantities will be reported for the years 1950, 1955, 1960, 1965, and 1970 and forecasts will be reported for 1975, 1980, 1985, and 1990.

I. NATURAL GAS SUPPLY TASK FORCE

A. Develop a procedure for verifying or auditing the AGA/API gas reserves data which will be satisfactory to independent experts, government, and natural gas industry people.

B. Develop historical data on natural gas industry exploration and development activities and expenditures, reserve additions, production and productive capacity (deliverability).

C. Define the relationship between oil and gas and establish a basis for oil which will permit the Task Force to direct its primary effort to natural gas.

D. Project future industry gas reserves additions by years using, if such proves to be appropriate, Potential Gas Committee assessments as a starting point. Projections should contain enough areal breakdown to facilitate subsequent "alternate cases" investigations and to provide data essential to the Transmission Technical Advisory Committee; the area breakdown used by the Potential Gas Committee in their report as of December 31, 1970, can probably be adapted to this need.

E. Project future industry gas production volumes and productive capacity (deliverability) by areas.

F. Develop a technique for estimating the average price of all (new and old, interstate and intrastate) gas being sold each year during the forecast period.

G. Project overland imports from Canada and Mexico, considering resource base, local requirements, probable levels of exploration activity and success, and sufficient U.S. demand to utilize all available overland imports.

H. Project (a) revenue, (b) capital requirements, (c) operating costs, and (d) net capital requirements for the Exploration-Production component of the U.S. natural gas industry.

I. The foregoing would be developed with emphasis on completing estimates for a "base case" set of conditions. Subsequent cases will evaluate factors affecting natural gas reserve additions, production, and productive capacity including:

1. Government regulations
2. Fiscal policies (including taxes)
3. Prices and costs (supply elasticity)
4. Field compression
5. Federal and state leasing policies
6. Environmental considerations
7. Others as may be appropriate

FEDERAL POWER COMMISSION,
Washington, D.C., December 1, 1972.

Dr. PAUL J. ROOT,
FPC Survey Coordinating Representative and Secretary, Supply-Technical Advisory Task Force—Regulation and Legislation, National Gas Survey, Federal Power Commission, Washington, D.C.

DEAR DR. ROOT: In compliance with the arrangements formulated at the November 16, 1972 meeting, I am submitting a minority (dissenting) report to the majority report of the Supply-Technical Advisory Task Force—Regulation and Legislation.

I would appreciate your circulating the attached report to the advisory personnel and members of the Task Force to determine whether they endorse the analysis and conclusions and are willing to join me in signing the minority report.

Sincerely yours,

DAVID S. SCHWARTZ,
Assistant Chief, Office of Economics.

Enclosure:

MINORITY (DISSENTING) REPORT

SUPPLY-TECHNICAL ADVISORY TASK FORCE—REGULATION AND LEGISLATION*

There is a great deal of valuable factual and analytical material in the majority report of the Task Force. The various sections of the report dealing with regulatory controls by state and local authorities over independent producer sales, domestic gas supplies in the lower 48 states, Alaskan gas supplies, imports (Canadian) and exports of natural gas, and supplemental supply sources (LNG, coal gasification, nuclear stimulation, and synthetic natural gas) offer a wealth of empirical analysis and a valuable historical document.

My reservations and the basis for this dissenting statement relate to portions of the analysis and the ultimate conclusions contained in Section I, Regulatory Powers of Federal Power Commission Over Natural Gas Sales by Natural Gas Producers, and Section III, Past and Present Legislative Proposals. The coupling of these two sections provides the heart of the recommendations of the drafting team consisting wholly of industry members. In essence, the report concludes as follows:

1. Producer regulation has been unsuccessful;
2. Commission disregard of the "commodity value" of gas and adherence to "arbitrary, imprecise, and subjective cost estimation technique" for ratemaking has resulted in inadequate gas supply at the lowest reasonable rate; and
3. Deregulation of natural gas producers is necessary to correct the supply-demand imbalance.

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*The views and opinions expressed in this Report are entirely personal and submitted in the writer's capacity as a Federal Power Commission representative on the Task Force. They do not necessarily reflect the views of the Commission Staff or Office of Economics.

To assess the validity of these conclusions and recommendations it is necessary to examine the framework of reference in which the analysis unfolds. Once the four corners of a problem are laid out the bounds are set. Factual material as well as analytical conclusions must fit the mold. Fundamentally, I disagree with the perspective of the majority report because I think it is premised on a "private interest" orientation and not the public interest standard which must motivate the Commission's regulatory activities under the Natural Gas Act.

The recommendation for deregulation is a mirror image of the persistent pursuit of this objective by the industry generally for more than two decades. In the recent meetings of the American Petroleum Institute (the major oil industry trade association), the first policy statement on energy issued called for the termination of the regulation of wellhead prices of natural gas as soon as possible.[1]

As an indication of the report's failure to comprehend the Commission's responsibility, and, of course, this is an advisory report to the Commission, nowhere is there any mention of the responsibility in line with the Supreme Court's CATCO decision[2] which charges the Commission to "afford consumers a complete, permanent and effective bond of protection from excessive rates and charges." This is the broad purpose of the Natural Gas Act which delegates to the Commission the responsibility of prescribing just and reasonable rates. The majority report's assessment of the landmark *Phillips* decision[3] by the Supreme Court placing natural gas producer sales under Commission jurisdiction is presented in a narrow legalistic context with the major emphasis on the dissenting opinions of a minority of the Court. Nowhere is there an indication of the broad "public interest" basis for the decision to place independent producers under regulation.

The Court in this case emphasized that the regulation of the sales of independent producers in the interstate commerce did not differ essentially from the sales made by an affiliate of an interstate pipeline company. The Court stressed:

"In both cases, the rates charged may have a direct and substantial effect on the prices paid by ultimate consumers. Protection of consumers against exploitation at the hands of natural gas companies was the primary aim of the Natural Gas Act."

The strength and logic to the deregulation argument rests on the assumption that there is effective competition in the producer industry. If this were a fact, there would be no logical basis for the original *Phillips* decision.

The Commission at numerous times has addressed this fundamental issue of whether the market is adequately competitive. In the first area rate decision (Permian Basin), the Commission said:

"There are admittedly many producers selling gas to the interstate pipelines both in the nation as a whole and the Permian Basin in particular, but nothing in this record suggests that any competition among them in making sales to the pipelines is in any way adequate to assure that the public will secure gas at just and reasonable prices in the absence of regulation.

The Commission in Permian further said:

". . . that the supply of gas controlled by the producers is so restricted in relation to demand that they have economic power to bargain for prices that will be injurious to the public."

Lastly, they concluded:

"There is no evidence of competition between producers to make new sales by offering lower prices. On the contrary the primary competition revealed by the record was among the pipelines to secure new gas supplies at higher prices. Whatever the degree of competition which may exist among producers it has not been effective to afford gas consumers the protection to which they are entitled under the Natural Gas Act."[4]

In the South Louisiana area rate proceeding, the Commission considered the effectiveness of competition by examining the history of price movements in South Louisiana. After pointing to the stability of unregulated field prices through 1950 at levels not exceeding 9¢/Mcf, the Commission pointed to the ever-escalating prices in this area from 1951 until a peak in 1958 in which the initial price of gas reached a level in excess of 24¢/Mcf. In the two years between 1951 and 1953, price levels more than doubled. This rise could not be accounted for by general inflation because the Wholesale Price Index moved downward in the 1951–1953 period. It points directly to market imperfections which challenge the contention of a "free and competitive market." The Commission in South Louisiana stated that:

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[1] "Oil Group Warns of Energy Ills" (William D. Smith), *The New York Times*, Nov. 14, 1972.

[2] *Atlantic Refining Company* v. *Public Service Commission of New York*, 360 U.S. 378, 388 (1959).

[3] *Phillips Petroleum Co.* v. *State of Wisconsin*, 347 U.S. 672 (1954).

[4] Opinion No. 468 issued Aug. 5, 1965.

> "Based upon this analysis we must conclude that there are serious market imperfections which preclude us from relying upon the free operation of the market, as evidenced by arms' length bargaining, to protect the ultimate consumer from unreasonable purchased gas rates." [5]

The absence of effective competition and the importance of costs as a regulatory criterion was recognized by the Supreme Court in its affirmance of the Permian decision when it said:

> "The field price of natural gas produced in the Permian Basin has in recent years steadily and significantly increased. These increases are in part the products of a relatively inelastic supply and steeply rising demand; but they are also symptomatic of the deficiencies of the market mechanism in the Permian Basin. Producers' contracts have in the past characteristically included indefinite escalation clauses. These clauses, in combination with the price leadership of a few large producers, and with the inability or unwillingness of interstate pipelines to bargain vigorously for reduced prices, have created circumstances in which price increases unconnected with changes in cost may readily be obtained." (footnotes eliminated)[6]

The majority report is too myopic and confining in assessing the importance of producer regulation. Fundamental to the initial determination to regulate producers is the awareness that the natural gas producing industry is an integral part of an essential industry (vested with the public interest) rendering an important public service. Producers and consumers are interconnected through a pipeline network and consumer protection can only be achieved by regulating wellhead prices in the field, rates charged by pipeline transmission companies, and ultimately regulation of local distribution company charges. Currently, approximately forty million residential consumers depend upon the use of natural gas in their households and are firmly tied by reason of their investment in gas-burning equipment; therefore, effective consumer protection necessitates regulation from the wellhead to the burner tip.

The deregulation of wellhead prices would result in serious misallocation of resources as well as unjustifiably high prices in the short run as well as the long run. In the immediate future, given the relatively large unsatisfied demand for gas, deregulation of natural gas prices could lead to spiralling wellhead prices to abnormally high levels which could be built into long-term sales contracts (the typical pipeline contract for gas is for 20 years) which would be much higher than the equilibrium price level that would obtain given more stable conditions in the long term. This is particularly true because there is evidence that gas supply is relatively inelastic (unresponsive to price changes) in the short run.

To examine the long-run implications of deregulation requires an assessment of producer industry structure. The rationale for deregulation of the industry is postulated on the premise that market forces in a workably competitive structure would bring about the lowest cost alternative and efficient resource allocation. If, in fact, the industry is not workably competitive and the market structure reflects institutional imperfections, then the converse is true; that is, the potential for higher prices than would exist under competition, and excess profits as well as resource misallocation will result.

One of the key arguments postulated by producers is that concentration is low and therefore the industry is workably competitive. The latest FPC statistics indicate that the largest 25 domestic producers (selling over one billion cubic feet of gas) in 1970 sold nearly 72% of the gas supplied to interstate markets.[7] In contrast to other industry sectors, this degree of concentration, standing alone, is not especially high. However, the use of the concentration ratio in the gas producing industry is inappropriate and unreliable as a measure of market conduct and performance. Firstly, the current production and sales reflect supplies under old contracts as well as new gas, of which the major portion is already committed under long-term purchase contracts. The relevant supply factor to measure concentration is the amount of new supplies brought to the market. Obviously, the amount of new gas provided would indicate a much higher concentration by the major producers. Secondly, the concentration ratio is deceptive because in the case of the gas producing industry it ignores the fact that major producers typically pool their capital in any large and risky undertaking (for example, offshore). As a result, these large sales of reserves are by combinations of large and small producers either under a single contract or as cosignatories under separate but identical contracts. Equally important is the fact that small producers are dependent upon the majors for a portion of their financing and as in oil the majors are the price leaders. In addition, there is the added benefit from higher gas prices because the interfuel relationship permits producers to obtain higher prices for oil products which compete with gas in the end-market.

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[5] Opinion No. 546 issued Sept. 25, 1968.

[6] *Permian Basin Area Rate Cases*, 390 U.S. 747 (1968).

[7] *Sales by Producers of Natural Gas to Interstate Pipeline Companies 1970*, Federal Power Commission.

It is the decision of the majors which conditions market strategy and provides a "community of interest" in presenting a united front in the dealings with pipeline companies. More importantly, the institutional arrangements are designed to provide new reserves as a package to prospective pipeline purchasers and not as individual supplies by single sellers offering their reserves in competition with one another. Therefore, independent price action and aggressive price competition among producers for sales to pipelines is a rarity.

The characteristics of a workably competitive market must embody the practices and bargaining power of both the buyers and sellers. Today, unlike the period 1933–1936 depicted in the Federal Trade Commission report as contained in the majority submission, the bargaining power (particularly in periods of unavalable gas supply) of the gas producers is greater than the pipeline sector. In dealing with producers, the pipelines are at a competitive disadvantage because they require substantial additional reserves to assure continued throughput and to support their market growth. The pipelines' need for assured supplies for many years in the future necessitates large-scale forward purchasing which tends to be centered in major producing areas where other pipelines exist. Gas supply procurement of new supplies is crucial if pipelines are to maintain deliverability. This must be seen in the context of only a small fraction of each year's total supply becoming available to new pipeline purchasers. Therefore, pipelines cannot risk alienating producers by hard bargaining in those areas where they seek new gas.

The pipeline-producer relationship must be seen in the context of the requirement that pipelines must demonstrate procuring a twenty-year supply, in most instances, in order to obtain financing, achieve operating efficiencies, and sustain profit levels. Moreover, the regulation of pipelines on a cost-of-service basis permits for recoupment of the higher cost of purchased gas through rate increases, and the recent automatic purchase gas adjustment approval (Order No. 452 issued April 14, 1972) by the Commission will eliminate any lag in recoupment of increased purchase gas costs. It is obvious that minimal pressure exists for the pipeline to drive a hard bargain and that his capacity to do so is seriously impaired vis-a-vis the strength of the producers.

In light of the potential dislocations in the short run as well as the long run, the need for intelligent regulation is greater today than at any time in the past. A legitimate question exists concerning the producer contention that the Commission's disregard of "commodity value" of natural gas and the resulting inadequate price policies has caused a supply-demand imbalance. Firstly, this allegation is a *non sequitur* because the Commission's rate-making procedure, in fact, is a determination of "commodity value." Secondly, during the past two years the Commission has significantly increased new gas prices from an average of 18¢ to 24½¢/Mcf (approximately 33⅓%). Additionally, the Commission has approved limited-term certificate sales at 35¢/Mcf. Thirdly, the producer claim is difficult to fathom because past Commission rate decisions have not deterred very substantial bidding for offshore leases with gas potential (the December 1970 sale resulted in commitment of $850 million).

Recent filings and statements by producer representatives indicate the potential impact of deregulation escalating natural gas prices up to the level of the cost of alternative fuels which would represent a possible doubling, or tripling, or greater price increases over the levels approved by the Commission. This would have a damaging impact on the Administration's desire to control price inflation and stabilize the economy.

Lastly, it is difficult to comprehend the assertion in the majority report that regulation of producers has reduced gas exploration efforts and resulted in a decline of new reserve additions. In the Hugoton-Anadarko and Second South Louisiana settlements, the majority of the producers agreed to the prices established as supply-eliciting levels. In the South Louisiana settlement, which provided a price of 26¢/Mcf for "new" gas, the producers explicitly indicated that:

"Each producer individually represents to the Commission that the ceiling prices and other provisions contained herein provide incentive for the exploration for and development of gas reserves in the Southern Louisiana Area."

The statement continues:

". . . it is believed that the ceiling prices and other provisions contained herein will make funds available to the producing industry and create a regulatory atmosphere which should provide an incentive for a substantial increase in exploratory and developmental activities and make a major contribution to bringing forth additional supplies of gas from the Southern Louisiana Area to meet the demands of all consumers supplied by this area."

At the 50th Anniversary Program of the Federal Power Commission, and most appropriate at this point in time, Chairman Nassikas addressed the question of deregulation. He assessed the viability of this proposal as follows:

"It has been suggested that the answer to regulatory problems is to deregulate producer pricing. I do not agree. At a time of a developing national supply crisis deregulation of producer price controls would be contrary to the national interest. There is serious question whether natural gas prices would be competitively determined in the absence of producer regulation, or whether interfuel competition can provide a meaningful restraint on the prices that can be charged by producers in all markets. While there may be active interfuel competition in certain industrial and commercial markets, price competition may be seriously impaired in the residental market. Residential consumers may therefore be subjected to unreasonable prices and producers could receive excessive returns and windfall profits to the detriment of the consuming public." [8]

The public interest objective and the success of producer regulation should provide these essential benefits:

1. A price which is high enough to elicit an adequate supply to meet market demands but which denies to producers the advantage of their exceptional bargaining position; and

2. A stable (but not necessarily level) price which will promote orderly markets and reduce uncertainties for producers in planning future investments for exploration and development.

To obtain these goals requires innovative and imaginative regulation. In order to minimize uncertainty and induce the industry to accelerate their efforts to find and commit new reserves, a new nationwide area rate proceeding should be promulgated with the objective of establishing just and reasonable rates quickly and with a view toward reinforcing continued regulation. The Commission should utilize a nationwide adjustment of area ceilings and terminate area-by-area adjudication. This will permit for a more realistic and interrelated approach in determining the necessary supply-eliciting price in all producing areas simultaneously. In addition, the Commission should revive the moribund data connection inquiry in Docket No. RI68–625—"Data for Continuing Regulation of Independent Producer Rates" (issued May 21, 1968). The Commission must have on a continuing and regular basis empirical data and cost information which is up-to-date to permit utilization of cost indices and trends, as well as, other market nformation for effective and rapid rate determinations.

Particularly at this point in time, after more than ten years of area rate hearings and litigation, the Commission has now crystallized the cost-of-service methodology along with the alternative noncost components. The underpinning of the area rate framework on a new nationwide basis can serve as an equitable format for providing producers a supply-eliciting price which will cover their revenue requirements (including a fair return) as well as providing consumers the necessary protection against exorbitant rates. The essentials for public policy were explained by Chairman Nassikas in the aforementioned 50th Anniversary address when he stated:

"We must reexamine the relationship of prospective price ceilings to market conditions—including the price of LNG, Canadian imports, and increasing quantities of gas sold intrastate—within a regulatory context which recognizes the realities of a reliable supply curve.

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[8] "An Outline of National Energy Policy: Some Personal Reflections," remarks of John N. Nassikas, Chairman, Federal Power Commission at the Commission's 50th Anniversary Program, June 3, 1970.

"Whatever level of rates may be prescribed they must be just and reasonable in the sense that they will produce an adequate level of return to attract the necessary capital for investment in the needed facilities for required service to the consumer."

DAVID S. SCHWARTZ,
Assistant Chief, Office of Economics,
Federal Power Commission.

December 1, 1972.

Senator HART. Our concluding witness today was to have been the very able chairman of the New York State Public Service Commission, Joseph C. Swidler. Chairman Swidler is tied up today at an important meeting with the Governor and the executive committee of the National Association of Regulatory Commissions. In his stead, and to deliver to the committee the statement that Chairman Swidler prepared, is Mr. Allen J. Roth. Mr. Roth is executive assistant to the New York Commissioner, and I believe has long held associate chairmanship. We welcome you and apologize for the delay.

As was the case with Professor Pifer, I would ask that Chairman Swidler's full statement be printed in the record and that the staff questions be directed to Mr. Roth.

If any of the questions are items on which you feel you should consult with the chairman before answering, we will leave the record open for them.

STATEMENT OF ALAN J. ROTH, EXECUTIVE ASSISTANT TO THE CHAIRMAN, NEW YORK STATE PUBLIC SERVICE COMMISSION, ON BEHALF OF JOSEPH C. SWIDLER, CHAIRMAN; ACCOMPANIED BY GEORGE BONNER, DIRECTOR, GAS DIVISION

Mr. ROTH. Thank you.

Mr. NASH. I will try to be very brief, Mr. Roth, considering the late hour.

Mr. ROTH. Before you begin, may I introduce my colleague, George Bonner, director of our gas division.

Mr. NASH. Mr. Roth, this morning an extract of page 12 of your statement was read: "To the extent the price increases induce commensurate in gas findings, the price increases serve a valid economic function." I would like to know whether you are aware, or the New York State Public Service Commission is aware of any evidence at all tending to show that higher prices will increase supply, and if so, how much higher?

Mr. ROTH. I am aware of no convincing evidence as to how much of an increase in supply will be forthcoming at various increases in prices. We have tested the proposition, among other places, in the southern Louisiana negotiations; we tried to elicit information from the producers to learn how much more gas we might expect from the increased prices proposed in the settlement negotiations. The upshot was a refusal by the producers, reflected in the often-quoted last paragraph of that settlement proposal approved by the Commission, a refusal to indicate how much additional supply would be forthcoming.

In addition, there are various elasticity studies that have been published, but I don't find any that has won final acceptance.

Mr. NASH. As I understand the coefficients range in elasticity from 0.1 to 0.5.

Mr. ROTH. I heard Chairman Nassikas state that this morning, but I am not familiar with the estimate calculated at 0.5.

Prof. Franklin Fisher of MIT, in his 1964 published study in relation to price increases for oil, indicated 0.3.

Based on my judgment that 0.3 might have been a short term elasticity coefficient.

Mr. NASH. I think it would be helpful for the record if you can demonstrate what is meant by supply-price elasticity, with a concrete example. What I mean, let's assume prices would rise from 30 cents to 80 cents per million cubic feet. How much additional supply might we expect, and what would be the actual price for the additional implement in relation to the alternatives, such as LNG?

Mr. ROTH. Let's take the case of a price increase from 30 cents to 80 cents, an increase of 166 or 167 percent. Assuming a supply elasticity coefficient of 0.5, you might expect an increase of one-half the 166 or 167 percent, that is 83 or 84 percent. If the 30 cents could be associated with 10 trillion feet of gas and the elasticity coefficient is 0.5, you might expect an 80-cent price to elicit something like 18.3 or 18.4 trillion cubic feet. The hypothetical at page 16 of Chairman Swidler's statement surrounds the 18.3 trillion cubic feet with estimates of 15 trillion cubic feet and 20 trillion, a higher and lower elasticity coefficient than the 0.5.

If an increase to 80 cents would induce an increase in findings to a level of 15 trillion cubic feet, compared to 10 trillion at 30 cents, the extra 5 trillion cubic feet would cost $1.80 per million cubic feet, a higher cost to the consumer. An incremental 10 trillion cubic feet would cost $1.30, still a high cost alternative.

Mr. NASH. This is based on the assumption of an elasticity of 0.5?

Mr. ROTH. It surrounds 0.5. Twenty trillion assumes a higher elasticity coefficiency than 0.5.

Mr. NASH. What might the cost be to consumers if there is a 0.1 elasticity coefficient.

Mr. ROTH. Give me a moment to calculate that.

Mr. NASH. Mr. Chairman, perhaps Mr. Roth would like to submit it in writing.

Mr. ROTH. If I may have one moment, I am near completing the calculation. The extra cost I calculate to be roughly $3.80 per million cubic feet; 80-cent prices would be associated with findings of 11.67 trillion cubic feet or nearly $3.80 for extra million cubic feet beyond 10 trillion cubic feet.

Mr. NASH. In summation, I take it this incremental cost is what Chairman Swidler himself contrasted with LNG at $1.25?

Mr. ROTH. Yes. It should be compared with the cost of LNG and other alternatives such as oil.

Mr. NASH. Thank you very much.

Mr. CHUMBRIS. I have no questions, Mr. Chairman.

As I told Mr. Roth earlier today, I read very carefully Mr. Swidler's statement. He has views that differ from the views of Mr. Nassikas, just as there probably will be Senators on the subcommittee who will prefer to follow Mr. Swidler, and some who will follow Mr. Nassikas. If we continue under this basis, one group is going to be able to get natural gas at 20 or 30 or 35 cents and another group is going to have to pay $1.60, $1.80 or $2.00 for a cubic foot. That is something that will have to be resolved. Thank you very much.

Senator HART. Thank you.

We will adjourn to resume in the hearing room of the Judiciary Committee, 2228 of this building, at 10 tomorrow morning.

[Whereupon, at 6:15 p.m., the hearing was adjourned, to reconvene at 10 a.m., Wednesday, June 27, 1973, in room 2228, Dirksen Senate Office Building.]

[The following was received for the record. Testimony resumes on p. 197.]

MATERIAL PRESENTED ON BEHALF OF CHAIRMAN SWIDLER

Exhibit 1.—Prepared Statement of Chairman Swidler

STATEMENT BY JOSEPH C. SWIDLER, CHAIRMAN, NEW YORK STATE PUBLIC SERVICE COMMISSION, PRESENTED BY ALAN J. ROTH, EXECUTIVE ASSISTANT TO THE CHAIRMAN

Chairman Hart and members of the subcommittee, pursuant to your invitation I am happy to present a statement of my views concerning proposals to deregulate the price of natural gas at the well-head. I have also been asked to state the rules and practices of the Federal Power Commission at the time I was Chairman of that Commission from mid-1961 through 1965 with regard to the handling and disposing of confidential information submitted to the Commission.

With regard to confidential information, I searched my memory and have also contacted former General Counsel Richard A. Solomon for any recollections or materials he or others may have on the subject. He in turn contacted our former colleagues Joseph Gutride, then Secretary to the Federal Power Commission, and Harry Trainor, then Executive Director. To the best of our recollection and without reservation, we had no special rule or practice with regard to confidential materials other than the rules that are widely applicable to such materials, including rules and practices applicable to the handling of documents classified for national security purposes and the separation and nondisclosure of employee health records. We had no rule or practice calling for the burning or returning of confidential materials and had no special rule at all for disposing of confidential documents or any other documents other than the general archival rules. We recall no irregular handling.

INTRODUCTION

As you know the Natural Gas Act was enacted in 1938 to fill a gap in the protection of gas consumers. *Philips Petroleum Company* v. *Wisconsin*, 347 U.S. 672. State regulatory agencies cannot effectively protect consumers who rely on gas if interstate gas companies, which are beyond the jurisdiction of the state agencies, remain free to impose unrestrained price increases on the local gas distributors and (through them) on the gas consumers. No one seriously proposes that the gas distributors should be freed from state regulation or that interstate pipelines should be freed from federal regulation. The rates charged by gas producers to the interstate pipelines should likewise remain subject to regulation unless the field market for gas is somehow self-regulating.

For reasons for which I shall explain in some detail in the remainder of my testimony, I do not believe that the unregulated market can be counted on to protect residential and other high priority gas consumers, especially not at this time of turmoil in the overall energy market, and I urge Congress not to enact legislation that would deregulate the field sales of natural gas in interstate commerce. I shall not address mysef to concentration ratios, numbers of buyers and sellers, and similar data, which sometimes dominate the debates and discussions about effective competition. I shall speak about the limits and uncertainties of ultimate gas supply, which in my view require continuing regulation of gas producers. Indeed, Congress should extend federal regulation to the so-called intrastate market, where it does not now apply, to regulate all field sales of gas at least with regard to end-use so that this nation may limit and eliminate the wasteful use of gas for inferior purposes and reserve that gas for high priority uses.

THE GAS RESOURCE BASE PROBLEM

1. *The U.S. Gas Potential.* The summary purpose of deregulating natural gas, we are told, is that prices must be allowed to rise sufficiently to balance supply demand by eliminating inferior uses of gas, alternatives which will more directy and demand. It seems to me that regulatory alternatives are available to reduce and assuredly reduce waste at lower cost than the proposed deregulation. These alternatives I shall discuss in a moment. First, however, I should like to explain why we cannot rely on deregulation to resolve the gas shortage on the supply side, and indeed cannot rely on natural gas even to maintain its share of the energy market, with or without regulation.

The National Petroleum Council has estimated that the demand for energy can be expected to grow at about 4.2% for the period 1971–1985 and about 3.2% for the period thereafter until about the year 2000. Table I presents (in column one) the estimated gas consumption in the United States if gas consumption were to grow at the same rate as the total demand for energy and thus maintain its share of the energy market. North American imports will accommodate a small part of the estimated U.S. demand. If the remaining demand (column 4) is to be met with domestic gas reserves, we shall need to prove up more and more gas reserves over the years; the specific reserve figures (column 5) have been calculated on the widely accepted approximation that we need an inventory of natural gas reserves equal to at least ten times the volume of annual consumption in order to assure the deliverability of the gas to be consumed.

TABLE I.—U.S. GAS CONSUMPTION, ASSUMING GAS MAINTAINS ITS PRESENT SHARE OF THE ENERGY MARKET; U.S. NATIONAL GAS SUPPLY ASSUMING NO CONSTRAINTS

[Trillion cubic feet]

Year	Postulated U.S. gas consumption (dry gas) (1)	Add extraction loss, storage changes, vented and flared gas (2)	Subtract net North American gas imports (3)	Postulated net U.S. gas production (1)+(2)−(3) (4)	Required gas reserves: 10 times (4) (5)	Findings required to maintain and augment reserves (6)	Cumulative findings (7)
Actual: 1972	22.61	0.85	0.95	22.51	266		
Projection:							
1973	23.56	.89	1.30	24.80	248	6.8	6.8
1974	24.55	.92	1.65	23.82	238	13.8	20.6
1975	25.58	.96	2.00	24.54	245	31.5	52.1
1976	26.65	1.00	2.20	25.45	254	34.4	86.5
1977	27.77	1.04	2.40	26.41	264	36.4	122.9
1978	28.94	1.09	2.60	27.43	274	37.4	160.3
1979	30.16	1.13	2.80	28.49	285	39.5	199.8
1980	31.42	1.18	3.00	29.60	296	40.6	240.4
1981	32.74	1.23	3.22	30.75	308	42.8	283.2
1982	34.12	1.28	3.44	31.96	320	44.0	327.2
1983	35.55	1.34	3.66	33.23	332	45.2	372.4
1984	37.04	1.39	3.88	34.55	346	48.6	421.0
1985	38.60	1.45	4.10	35.95	360	50.0	471.0
1986	39.83	1.50	4.32	37.01	370	47.0	518.0
1987	41.11	1.55	4.54	38.12	381	49.1	567.1
1988	42.42	1.59	4.76	39.25	393	51.3	618.4
1989	43.78	1.65	4.98	40.45	405	52.5	670.9
1990	45.18	1.70	5.20	41.68	417	53.7	724.6
1991	46.63	1.75	5.42	42.96	430	56.0	780.6
1992	48.12	1.81	5.64	44.29	443	57.3	837.9
1993	49.66	1.87	5.86	45.67	457	59.7	897.6
1994	51.25	1.93	6.10	47.08	471	61.1	958.7
1995	52.89	1.99	6.32	48.56	487	64.6	1,023.3
1996	54.58	2.05	6.54	50.09	501	64.1	1,087.4
1997	56.33	2.12	6.76	51.69	517	67.7	1,155.1
1998	58.13	2.19	6.98	53.34	533	69.3	1,224.4
1999	59.99	2.26	7.20	55.05	551	73.1	1,297.5
2000	61.91	2.33	7.40	56.84	568	73.8	1,371.3

SOURCE

Column (1): 1972—U.S. Department of the Interior, News Release, "1972 U.S. Energy Use Continued Upward," March 10, 1973; 1973–85, 4.2 percent annual growth; after 1985, 3.2 percent annual growth.

Column (2): 1972—Cols. (3) plus (4) less col. (1); 1973–2000, 2.76 percent of col. (1).

Column (3): 1972—U.S. Department of the Interior News Release, "1972 U.S. Energy Use Continued Upward," Mar. 10, 1973; 1973+, Walter G. Dunree, Jr. and James A. West, "U.S. Energy Through the Year 2000," December 1972 (U.S. Dement of the Interior). Includes Canadian gas and small volumes of Mexican gas.

Column (5): 1972—A.G.A., Gas Supply Review, May 15, 1973; 1973+, column (4) times 10.

Column (6): Required yearend reserves, less beginning of year reserves plus net production [col. (4)].

The consequent volume of gas findings necessary to replace consumption and build up the inventory of postulated reserves (column 6) amounts to a tremendous volume of gas, more each year than has been found in any year in our prior national experience. Indeed, the finding rate must exceed 40 trillion cubic feet per year by about 1980 if we are to satisfy the demand with domestic natural gas. Within the past 20 years our best finding rate was about 24.7 trillion cubic feet in 1956, and the best five-year average finding rate was about 21 trillion cubic feet in 1955–1959. The sharp and continuing expansion in domestic finding would need to take place despite progressive exhaustion of underground supplies.

If we were to achieve such a high level of natural gas findings, the cumulative findings of gas (beyond the reserves already in our proved inventory of national reserves) would reach about 283 trillion cubic feet some time in the year 1981 or before. The Potential Gas Committee, a group of industry, government, and academic experts, recently estimated that about 266 trillion cubic feet of natural gas remain to be found in known fields. Another 384 trillion cubic feet are estimated for new fields in hydrocarbon provinces that now produce oil and gas. A final 496 trillion cubic feet might be found in new provinces that do not now produce hydrocarbons, according to the Committee. Thus, by 1981 we would need to find the equivalent of virtually all our probable new gas reserves; by the late 1980's or earlier we would need to find the equivalent of all probable and promising natural gas reserves; and before the end of this century we would have exhausted the full probable, promising and speculative domestic natural gas reserves which the Potential Gas Committee thinks may exist.

Perhaps the most salient feature of the estimates I have presented in Table I is the annual finding rate that is needed if we are to meet the demand for gas with the discovery of domestic natural gas reserves. We must assume that over the years, as total reserves are depleted, it will be more and more difficult to find gas, absent some exploration breakthrough that we cannot now foresee. Given the estimated limits on our potential gas reserves, it seems unlikely to me that we can soon achieve a doubling of past finding rates or, if we succeed in doubling the finding rate, that we could long sustain such a pace. If we proceed directly to find all probable gas reserves, we may be able to meet the domestic demand for gas into the year 1980. At that point we had better be in position to rely on substantive alternative sources of gas.

Despite its talk about the importance of market forces to induce new supplies, the petroleum industry does not itself hold out any prospect for domestic natural gas sufficiency. The National Petroleum Council has projected that "under the most optimistic supply conditions", including a high rate of growth in drilling and a high volume of gas found per foot drilled, domestic gas production will rise to only 31.9 trillion cubic feet in 1985, including 4.4 trillion cubic feet from Alaska and 1.3 trillion cubic feet from nuclear stimulation of tight formations; in the lower 48 states the optimistic projection calls for an increase in domestic natural gas production from 22.2 trillion cubic feet in 1972 to only 26.2 in 1985. Under less optimistic assumptions of a medium growth in drilling but a high rate of gas found per foot drilled, the NPC projects that gas production will reach 27.3 trillion cubic feet in 1985, including 23 trillion cubic feet in the lower 48 states. The NPC at the same time claims "revenue requirements" in the range of 70c to 80c for gas from new fields to sustain even these levels of production. According to the NPC, "revenue requirements" of less than 70–80c per Mcf could only be associated with steeply declining production.

I do not vouch for the NPC price and production figures. Indeed, it seems obvious that consumers, who are necessarily remote from this flood of detail, will want such claims about revenue requirements to be subject to continuing impartial review and will want to avoid the hopeless strain of bidding up gas prices beyond their worth in gas supply. I shall return to this point in another context. My point is that the data show, and the industry's figures seem to confirm, that we cannot rely on deregulation to solve the gas shortage on the supply side.

2. *The Southwestern Gas Potential.*—Virtually all of this Nation's gas is produced in the southwestern states and related offshore areas. The Potential Gas Committee has estimated that potential reserves in the Southwest—including probable, possible and speculative reserves—amount to 578 trillion cubic feet, in addition to already proved Southwestern reserves of little over 200 trillion cubic feet. If the industry finds all of the 578 trillion cubic feet of potential gas in the southwest, which seems unlikely, the area could continue production levels of about 23 trillion cubic feet per year for only about 24 years, after

which remaining reserves would fall below 230 trillion cubic feet and would thus be unable to sustain production of 23 trillion cubic feet per year (assuming the validity of the rule of thumb that a reserve inventory of 10 is necessary to produce one unit of gas). After that, the remaining gas would be played out over many additional years, at diminishing rates of annual production. As it happens, the pipeline systems of America have on average a depreciable remaining life of a little over 20 years, less than the time it would take to exhaust the potential gas supply estimated for the Southwest at substantially the present rates of the delivery without growth. Accordingly, if deregulation leads to increased usage within the Southwest (for example, if Texas consumers buy up the offshore gas supplies that now tend to flow to interstate markets), the interstate pipelines will carry less and less gas, at higher and higher costs per Mcf, and customers outside the Southwest must turn increasingly to other sources.

3. *Additional U.S. Gas Potential.*—There may of course be more gas than has been estimated by the Potential Gas Committee. The Committee's estimates of 1,146 trillion cubic feet nationally include offshore territory out to 1500 feet of water depth and, within that perimeter, drilling depths to 30,000 feet. The estimate includes the gas in Alaska, which of course is not immediately available to the contiguous states. The Potential Gas Committee's estimate does not include roughly 300 trillion cubic feet of gas that might become available by fracturing tight formations.

In 1972 the U.S. Geological Survey gave a different and larger estimate of natural gas reserves at 4,418 trillion cubic feet, which would enable us to meet projected demand for about two decades longer than the gas estimate of the Potential Gas Committee, if all the estimated gas were found in needed amounts. I mention this estimate simply to demonstrate that even the most generous estimate of potential gas reserves does not take us much beyond this century, assuming that we proceed to find all of the reserves as fast as we need them according to conservation estimates of need (demand).

Obviously, we will not proceed directly to find all the estimated gas reserves, and accordingly domestic natural gas discoveries will fail to meet the demand for gas in the United States well before the end of this century. High natural gas prices may speed up the discovery of gas and will help us find relatively more of what is potentially available. Even then, price increases can have a favorable effect only if they apply with finality and are not subject to such change and uncertainty as to induce producers to wait until another day when still higher prices may be negotiated. It seems unlikely in any event, however, that we will be relieved of the need to turn to other sources of gas, in addition to domestic natural gas reserves, long before the end of the century.

4. *A Caveat about Reserve Data.*—I recognize the importance of reliable gas reserve data and our need to have a reliable estimate of this nation's gas resource base. Dr. V. E. McKelvey, Director of the U.S. Geological Survey of the Department of the Interior, is of course right in his recent call for further studies to improve our understanding of America's potential for gas and other resources. I have relied on the available data, however, because the data seem to demonstrate in all events that this nation does not appear to have gas resources so abundant that we can afford to drop producer rate regulation in reliance on so-called market forces.

At the same time, I take no stand about the reliability of published estimates of proved U.S. gas reserves, whether the industry or the government has underestimated the existing inventory of reserves, or the extent to which any underestimate has induced the extraordinary recent increases in gas prices asked by sellers and offered by buyers.

CONSUMER VERSUS CONSUMER

According to the fact sheet underlying the President's April 18, 1973 Energy Message, a principal purpose of gas deregulation is to "allow the interstate pipelines to compete with the intrastate pipelines for new gas supplies and lead to a more desirable distribution and usage of this premium fuel." The competitive predicament of interstate pipelines is real, but deregulation is not the cure.

Intrastate gas—gas consumed within the state of production—is not now subject to the Natural Gas Act (unless delivered through an interstate pipeline), and intrastate pipelines and other local buyers are now free to bid away gas supplies from would-be interstate buyers, who can only pay federally regulated field prices. In recent years intrastate buyers have in fact virtually monopolized new gas supplies, as the data presented in Table II demonstrates. (The data excludes Alaska because no gas is shipped from Alaska to other states and excludes the offshore domain because almost all of that gas is subject to FPC jurisdiction and in effect could be preserved for interstate buyers.) Sales to interstate pipelines in the 48 states (excluding offshore sales) increased from 9.3 trillion cubic feet in 1964 to 11.8 trillion cubic feet in 1970 and then declined to 11.4 trillion cubic feet in 1971 (see column 1 of Table II). Reserve dedications to the interstate pipelines rose from 9.2 trillion cubic feet in 1964 to 11 trillion cubic feet in 1967 and then declined precipitously to virtually none in 1969–1971 (the most recent data). (Indeed in 1970 there was a substantial downward revision of reserves previously reported by the interstate pipelines.) The data prove that by 1969 the intrastate buyers were acquiring virtually all available onshore gas reserves.

TABLE II.—GAS DEDICATED TO INTERSTATE PIPELINES—EXCLUDING OFFSHORE GULF COAST AND ALASKA

[In millions of cubic feet]

Year	Production	Reserve additions	Year-end reserves
1964	9, 310, 159	9, 191, 195	169, 920, 344
1965	9, 568, 469	9, 540, 624	169, 892, 499
1966	10, 129, 100	10, 494, 498	170, 220, 255
1967	10, 530, 072	11, 058, 788	170, 748, 971
1968	11, 092, 657	6, 105, 081	165, 761, 395
1969	11, 577, 968	334, 004	154, 517, 431
1970	11, 767, 848	(2, 765, 824)	139, 983, 759
1971	11, 419, 486	290, 413	128, 854, 686

Source: Federal Power Commission, "The Gas Supplies of Interstate Natural Gas Pipeline Companies."

The following additional data, taken from testimony introduced in a recent Permian Basin Area proceeding at the Federal Power Commission (Docket No. AR70–1) likewise demonstrate the capture of new gas by intrastate buyers.

TABLE III.—INITIAL ANNUAL VOLUMES UNDER NEW INTERSTATE AND INTRASTATE CONTRACTS—LARGE PRODUCERS: PERMIAN BASIN AREA, 1966–70

[Billions of cubic feet at 14.65 lb/in²a]

Year	Interstate	Intrastate	Total
1966	149.0	29.0	178.0
1967	60.4	16.8	77.2
1968	20.0	136.1	156.1
1969	29.4	146.4	175.8
1970 (6 months)	10.3	103.1	113.4

Under the President's proposal, gas producers would be free from regulation of new gas supplies, and thus interstate buyers could bid against intrastate buyers in the producing states with some possible supply benefits to the interstate markets but with sky-rocketing price consequences. To the extent the price increases induce commensurate increases in gas findings, the price increases serve a valid economic function. However, to the extent that the increases go beyond that, they simply reflect the effect of pitting one group of buyers against another for a static supply. In this situation only the producers gain.

Furthermore, under deregulation the interstate buyers stand to lose some supply advantages. Under the present Natural Gas Act, the Outer Continental Self, which is entirely under Federal domain and holds vast potential for gas reserves, is completely subject to federal regulation. The Federal Power Commission could reserve gas found there for the interstate market, as an offset to the advantage that intrastate buyers now have in capturing local unregulated gas production. The American Gas Association reports over 38 trillion cubic feet of proved natural gas reserves in the offshore Gulf area. The interstate pipelines reported contracts covering about 32 trillion cubic feet of the gas reserves there. See Table IV. The six trillion cubic feet of difference indicates some gas proved by the producers but not yet dedicated for sale (and may also reflect some data differences between the two reporting sources). I should note that in recent years the offshore gas secured by the interstate pipelines has not offset the decline in their onshore gas reserves. Yet, the offshore potential remains substantial and has been a principal hope and objective of the interstate market.

Under the President's proposal for deregulation, buyers from Texas and Louisiana would be able to bid up the price for offshore gas reserves, which previously could have been channeled to interstate buyers, primarily for the residential and commercial markets, that is, for high priority uses. I do not expect the Federal Power Commission to attempt to impede the transfer of offshore gas to southwestern markets, because the very purpose of deregulation appears to be the allocation of supply according to free market price. In sum, the interstate pipelines may well loss far more gas offshore than they could gain onshore under deregulation.

TABLE IV.—YEAR END GAS RESERVES, OFFSHORE GULF COAST

[In millions of cubic feet]

Year	AGA (1)	FPC (2)
1968	35, 851, 529	29, 200, 638
1969	35, 306, 705	33, 091, 839
1970	37, 781, 044	33, 993, 229
1971	38, 397, 675	32, 415, 295

Note: The American Gas Association did not separately report offshore reserves prior to 1968. The difference between cols. 1 and 2 reflects reserves found but not committed to interstate pipelines and may reflect other data differences.

RAISING PRICES TO REDUCE WASTE

Apparently, the purpose of deregulation is not to pit household users of gas in New York and Michigan and California against household users in Texas or Oklahoma but rather to allow the householders to bid up the price of gas in competition with the gas-burning industrial market, predominantly in the Southwest and including gas-fired electric utilities in the Southwest and elsewhere.

Much of the boiler fuel use and other low priority use of gas is being wrung out by regulation at the state and Federal level. New York and other states served by the interstate pipelines have already established priorities for curtailing existing low priority uses and for confining new service to high priority users, principally residential users. The Federal Power Commission has also undertaken to reduce or eliminate the use of gas for inferior purposes in the interstate market.

These regulatory measures directly and effectively restrict and eliminate the use of gas for inferior purposes, and federal regulation should be extended to cover the intrastate market to achieve these end-use control purposes. Deregulation of fuel prices for the interstate market would be a slow, uncertain and very expensive alternative for suppressing inferior uses in the intrastate market. To begin with, deregulation will not reach or significantly affect gas already dedicated directly to boiler fuel users and other large industrial users in the intrastate market. Second, higher market prices for new gas in the field will not directly suppress the demand of industrial gas consumers served by gas utilities or similar systems, because old and new gas supplies and prices would be rolled together by the distributors, an effect recognized expressly by the President in referring to the regulated market for gas. Finally, even with regard to those intrastate users which will depend directly and significantly on high priced new gas, I do not imagine that such users will yield lightly to competing interstate buyers. Electric utilities in the Southwest, for example, may be expected to pay higher prices and resist the temptations to turn to coal (or perhaps imported residual oil) until they can rest assured that they will be able to obtain adequate long-term supplies of coal and will not be prevented from securing or burning the coal because of new coal mining restrictions or air pollution restrictions or for other reasons. The utilities may nevertheless turn to coal if gas supply becomes unavailable or unreliable because of regulated end-use controls or for other reasons.

LEAST COST ALTERNATIVES

Let us assume that a multiplication of prices would make available some additional gas, and let us look at the incremental costs. Suppose that a price of about 30¢ per thousand cubic feet would induce the finding of 10 trillion cubic feet of natural gas per year but that a price of 80¢ would induce the finding of 15 trillion cubic feet. The total bill would be $3 billion for the first ten trillion cubic feet and $12 billion for the 15 trillion cubic feet, or $9 billion additional for the extra 5 trillion cubic feet—$1.80 per Mcf for the increase in findings. If the 80¢ price would induce the finding of 20 trillion cubic feet, the extra 10 trillion would cost $1.30 per Mcf. I cannot tell you whether these hypothetical supply and price relationships are realistic, and I am not alone in this difficulty. The producers will not and probably cannot state, even roughly, what supplies would be forthcoming at various prices or what the difference in findings would be at various differences in price levels. My point, however, is that prices of 70 or 80¢ for new gas may not be cheap or reasonable if gas consumers can obtain much of the gas supply at 30¢ per Mcf and satisfy their remaining needs through other fuels at 80¢ or even $1.00 or more per million per Btu. (One million Btu is approximately the heating value of an Mcf of natural Gas.) Remember the additional price does not make new gas, but only produces underground reserves more quickly than would otherwise be the case if the price increases were stretched out over time. It is arguable whether our national interest lies in spurring the most rapid possible exhaustion of U.S. reserves.

Free market economists might nevertheless argue that 80¢ is the right gas price in terms of the hypothetical case, because the extra profit or "economic rent" on the first ten trillion cubic feet would be recovered in part through taxation and lease bonuses and the remaining part would constitute a redistribution of income from consumers to producers, not a true using of economic resources as in the case of SNG, LNG or oil at 80¢ or $1.00 per million Btu. As a bill-paying consumer, I still might prefer the combination of 30¢ gas plus $1.00 oil. In any event, with regard to the technical point about resource use and allocation, my understanding of the industry is that average costs for new gas tend to follow prices and it is difficult to say whether the producers will get "economic rent" (except in regard to previously acquired leases).

I put aside a special category of gas prospects, where the likelihood of finding gas is very high but likely size of the reserve is small enough to make the prospect uneconomic except at substantially increased prices. Regulation can easily cope with this category of problems by raising the general applicable rate ceiling, if that proves necessary, or by granting rate exceptions for this type of prospect. Deregulation is not necessary to bring in this category of gas.

Finally, time considerations will delay and dilute the significance of price increases under regulation or under deregulation. It takes years of exploring, leasing and drilling before production begins. Even if unregulated prices ultimately "clear the market" by substantially augmenting supply, in the meantime shortages would persist and gas prices can be expected to rise significantly and painfully without present commensurate supply benefits. The President's own proposal for deregulation would authorize the Secretary of the Interior to correct price gouging during the first three years of deregulation, thus proving the need for continuing regulation.

In all events, I can see no sense in deregulating old gas upon the expiration of existing contracts. Deregulation of previously dedicated fields will not add to our inventory of gas supplies. In these times of shortages, deregulation will accomplish nothing but to add to the profits of established producers who own the old reserves, as they raise prices without limit to buyers who are dependent on the remaining gas in the old fields. I have heard the argument that raising old gas prices will add to the cash flow available for further finding efforts. But the inducement favors only the established producers, who own the old gas, and even as to them imposes no requirement that the additional revenues in fact be expended on further finding efforts.

CONCLUSION

Of course, gas prices should be allowed to rise over time in order to capture all potential gas reserves which are economic to find and produce. Deregulation in these times of gas shortages, however, is unnecessary and is likely to lead to excessive gas prices.

There are many steps we must take to confront gas shortage and otherwise resolve this nation's energy problems, but deregulation is not a step in the right direction.

First, we must significantly increase the scope and magnitude of our energy research and development programs both in government and in industry.

Second, we must initiate promising energy conservation programs at the federal, state and local level to reduce energy waste and achieve improved energy efficiencies in buildings, in appliance and apparatus, in transportation and in industry—not alone by appealing for the voluntary cooperation of consumers or by depending upon price increases to restrain waste but also by positive measures to improve building codes, support mass transit systems, restrict the size of automobiles, and establish minimum requirements for energy efficiency in appliances and apparatus sold in interstate commerce.

Third, environmental and other restrictions must be reevaluated and, if necessary, adjusted so that we may achieve a responsible balance of our environmental, economic, national security and other important social objectives. The flight from coal to oil and gas must be arrested by a combination of technological improvement and the removal of any unjustified restraints.

Finally, this nation must develop its domestic oil, gas, coal and uranium resources, through measures including expedited and improved leasing practices by the Department of the Interior, and must accommodate the building of adequate fuel refining, storage and transportation facilities as well as electric power facilities, including nuclear power plants and coal-fired power plants, subject to reasonable but not arbitrary environmental and safety restrictions, in order to assure reliable energy supplies and avoid the costs and risks of overdependence on foreign energy sources.

Exhibit 2.—Paper Entitled "Energy and the Environment"

ENERGY AND THE ENVIRONMENT: A NATIONAL POLICY—A REGIONAL RESPONSE

(A talk by Joseph C. Swidler, Chairman, New York State Public Service Commission)

(May 1, 1973)

The President's long awaited energy message covers in one way or another most of the energy problems and provides a convenient focus for discussion of the primary energy issues. It is a landmark in several ways—in the recognition of the seriousness of the problem, of the need to marshall this country's governmental and private resources to solve it, and in relating energy and environmental issues. For the first time, I believe, there is a commitment in principle to limit the growth in energy use.

On the other hand, it is a disappointment because it does not go far enough. The recommendations are out-of-scale of the dimensions of the problem. Even the full implementation of the measures recommended by the President would not go far towards curing this country's energy malaise. There are some helpful recommendations, some which either move in the wrong direction or do not go far enough to be effective, and a number of omissions on key issues.

Of course, I cannot mention all these matters, and on some of them I do not yet have a strong opinion. Naturally, I shall devote most of my limited time to matters I believe deserve further thought, but first let me mention the positive elements of the energy message. The chief items on which I strongly agree are to mandate a broadening of the Interior leasing program on the Outer Continental Shelf, and the expressed determination to resolve the Alaskan oil impasse. These measures should serve to stabilize and perhaps augment domestic oil and gas supplies. The encouragement of geothermal development and shale oil recovery in the public domain fall in the same category of adding at least potentially, to domestic energy resources.

I endorse the President's proposal for reconsideration of secondary air pollution standards. As he rightly points out, we must look more and more to coal to meet this country's energy requirements. We cannot afford the luxury of ruling out the use of coal where there is no clear environmental gain.

I favor also his recommendation for federal power plant siting legislation. The bill introduced in the last session of Congress seemed to me to be defective and probably unworkable. Perhaps the changes to which he referred and which I have not yet seen will produce a workable measure.

The message reflects the unfortunate fact that there is no way to prevent large increases in oil imports. The elimination of the oil import quota program should improve the ability of oil importers to buy necessary oil supplies on a more favorable basis than would otherwise be possible, and should be especially helpful in rationalizing the market for refined products in the next few years. I commend also the proposal for Federal licensing of tanker terminals, which are essential to handle the rising volume of imports, and encouragement for the construction of additional domestic refining capacity, which will improve the Nation's security position.

When we look on the other side of the picture, there are many matters where the President seems to me to have erred in his judgment or where he has failed to come to grips at all.

Perhaps the most controversial of his recommendations is for the deregulation of field prices on new gas supplies and on flowing gas sold under new contracts. I recognize that deregulation has broad support not only from natural gas producers but also from many disinterested citizens, including most of the academic economists. The argument is two-fold, that regulated prices are artifically low and thus encourage wasteful use, and that the high prices which would follow, if "the competitive forces of the market system" dictate the price, will stimulate production and help relieve current shortages.

As to the encouragement of uneconomic use, there seems to be no prospect that underground gas supplies will be available to the interstate market in quantities beyond those essential for primary needs of customers who have no economical alternative. End-use controls in almost every state dependent upon the interstate market already assure the utilization of available gas supplies for their best purposes.

As to the effect of deregulation in encouraging additional production, the case is yet to be proved. No industry spokesman has ventured even a rough estimate of the amount of gas which they would produce at 50 cents or $1 an Mcf, or $2 per Mcf, which they would fail to produce at 35 cents, to pick more or less arbitrary parameters. The reliance on "market forces" I find incomprehensible in the light of the economic environment and resource position of the domestic petroleum industry. "Market forces" seem to me to be beside the point when total reserves are small in relation to potential demand; when a large part of the findings are related to exploration for oil rather than gas; when oligopoly pricing prevails; and when, in the absence of regulation the price will be determined not by domestic supply costs, but by imports which entail the combined costs of buying gas in far corners of the world at prices dictated by a cartel of the producing countries, bringing it to a port by pipeline, converting the gas to a liquid (LNG) by cryogenic processing, transporting the LNG halfway around the world in special cryogenic vessels, transferring and storing the material at dockside, and ultimately regasifying the LNG for delivery to the domestic market. Are these what the President means by market forces? Deregulation will ultimately mean additional costs to consumers of hundreds of billions of dollars. It should not be undertaken without some better reason to think it will contribute substantially to increased supplies.

What is certain is that supply cannot catch up with demand in the foreseeable future at any conceivable price, that consumers have no effective bargaining position, that even the price of artificial alternatives is now dependent upon imports of LNG and feedstocks for artificial gas from countries which have organized a tight cartel, and that the prices imposed by alternative supplies of imports and production of artificial gas confer stupendous windfalls on producers in relation to their finding and producing costs for domestic gas.

Some of you may know that I had some responsibility for developing the system of regulation of gas prices, and I could not object if you doubted my capacity for total objectivity. Nevertheless, I must say what I think. Field price regulation can serve the national interest if it is administered firmly and sympathetically, and if present statutes are modified in light of present shortage conditions. If natural gas regulation were extended to the so-called intrastate market, and if the Federal Power Commission fixed natural gas prices at generous levels in relation to the costs of finding new gas, the country would enjoy substantially as great gas supplies as under deregulation, without conferring astronomical windfalls upon the producers. I assume, of course, the same encouragement for exploration on the Outer Continental Shelf and in Alaska which the President has incorporated in his energy message, as well as one or two other sources of encouragement which I did not mention.

There is a self-defeating feature in the president's message. The message deplores the use of gas by industries and utilities, which might better use coal or oil. By releasing gas from regulation by the Federal Power Commission, however, the President makes it possible to escape end-use controls and to permit the diversion of new gas supplies to boiler fuel and refinery uses, for which the other fuels are available. The recommended FPC rate control for industrial sales would not prevent this diversion. Moreover, under present law, the discoveries on the Outer Continental Shelf could be reserved for the interstate market, to offset the exemption of intrastate sales. Under deregulation the producer states could bid for his gas for inferior uses, and with their advantage of lower tranportation costs, could corner an even larger share of production than at present. Thus his program may result in less rather than more gas for the American householder.

I am aware of an essential dilemma. The members of the Federal Power Commission as presently constituted have expressed themselves as disbelieving in the feasibility of their charge to regulate gas prices. In the circumstances it is not strange that they cannot make regulation work. I will say, however, that under present shortage conditions the regulatory responsibility may be impossible to discharge as long as the producer states are free from any controls. The cure is to eliminate the discrimination.

The proposal that the Interior Department be granted authority to fix a ceiling price for gas if necessary I find hard to understand. Why are Interior price ceilings better than FPC price ceilings in their effect on market forces? In any case, the history of temporary price stabilization ceilings provides little reassurance to gas consumers.

Let me mention briefly what I regard as a few of the other major deficiencies in the energy message:

1. This country's energy position does not permit the massive amount of waste which is embedded in United States energy practices at almost every level and type of use. The President recommended tightening of FHA insulation standards, and energy efficiency labelling, which are good as far as they go, but any one or two conservation steps can only cover a small part of the problem. For the rest the President relies on hortatory efforts by a new office to be lodged in the Department of the Interior. He said nothing about the most conspicuous area of waste, in automobile transportation. No program was laid out for reduction of use for heating, lighting and cooling. The problem of waste in industry was ignored. What is essential in this country is a drastic reduction in the rate of energy growth. Voluntary programs have their place, but the required degree of conservation cannot be achieved by tokenism, or by jawboning alone.

2. Similarly, there was general endorsement of research, but no commitment of the necessary resources for an adequate program. If the energy problem is as serious as the President now recognizes, if it is truly bound up with questions of national security and survival, we must somehow find the money and dedicate the research capability to develop new energy sources and to make better use of the ones we already enjoy. Senator Jackson has called for a $2 billion a year research program, almost three times as much as the President has recommended. Accepting the President's appraisal of the seriousness of the energy problem, the Jackson program is none too big.

3. The message mentions without elaboration that the President has instructed the Department of State to develop a program for international cooperation to develop "international mechanisms for dealing with energy questions in time of shortage." The President does not say, but I hope he means, that the role of the multinational oil companies will receive careful scrutiny to determine their future role and continuing usefulness as the brokers between the oil surplus and oil deficit nations of the world. It may well be that the consuming nations must provide a supplement for their activities, because it is at least a fair hypothesis that their interests and those of the consuming nations no longer coincide.

4. This country operates on an effective 30-day reserve of oil, which was adequate before we were dependent on imports, but which is ridiculously hazardous as our import dependence increases. I had looked for a firm recommendation by the President for a security reserve, but the message recommended only further study.

5. The President has recommended more leasing of land for petroleum exploration, but he has said nothing about the bonus bidding system or the need to change the Interior Department lease forms to assure accelerated development on leased lands. Cash bonus bidding limits the number of bidders to the large companies, and diverts to the Treasury money which should be used for exploration and development. There are many better systems, and the Administration should pick one. Also, there is good reason to think that under current leasing practices many oil companies have sat on their leases to await the higher prices which the Federal Power Commission and other official spokesmen have virtually assured them were coming. Consumer organizations have urged reform in both these areas for a number of years, but have yet to hear either a reasoned justification for the present situation or a commitment to change.

6. The President has not called for the basic reconciliation of environmental and energy values which is necessary if we are to protect the public interest by a policy mosaic which assures that the twin goals of environmental protection and energy adequacy are considered jointly and in relation to each other. For example it is time to challenge the arbitrary, unworkable and perverse requirements for zero water pollution and total non-degradation of the atmosphere. These are stifling to the economy and make the energy problem totally insoluble.

7. The plight of the independent oil distributors and gasoline marketers deserves a word. The first impact of shortages has been for the majors to cut their sales to many independents in order to conserve their supplies for their own retail outlets. I fear that without prompt action by the federal government to allocate supplies to the independents, much of the independent industry will not survive the summer. The independent marketers have played an important role in tempering the pricing practices of the petroleum oligopoly, and the consumers of this country will miss them when they are gone.

THE NATURAL GAS INDUSTRY

(Competition and Concentration)

WEDNESDAY, JUNE 27, 1973

U.S. Senate,
Subcommittee on Antitrust and Monopoly
of the Committee on the Judiciary,
Washington, D.C.

The subcommittee met, pursuant to notice, at 10 a.m., room 2228, Dirksen Office Building, Hon. Philip A. Hart presiding.

Present: Senator Hart.

Staff present: Charles Bangert, general counsel; Bernard Nash, assistant counsel; Peter Chumbris, chief counsel for the minority; and Charles Kern, minority counsel.

Senator Hart. The committee will be in order.

I am delighted to welcome the Chairman of the Federal Trade Commission, a distinguished employee and very able man, Lewis A. Engman.

STATEMENT OF HON. LEWIS A. ENGMAN, CHAIRMAN, FEDERAL TRADE COMMISSION

Mr. Engman. Thank you, Mr. Chairman. It is a great pleasure for me to be here with you this morning to review our activities at the FTC concerning the energy industry.

I will be followed this morning by two members of the staff of the Commission who are with me, Mr. James Halverson, the director of our Bureau of Competition, and Dr. H. Michael Mann, director of the Commission's Bureau of Economics.

My remarks will cover the genesis of the Commission's energy investigations and summarize our efforts to date.

I will also outline the staff resources which are being devoted to these various studies and investigations.

I do want to make one point, and that is that I am not in a position to discuss the substance of these ongoing investigations in detail. To do so would raise the possibility that my participation might be challenged in some later adjudicatory proceedings which may come before the Commission. For this reason, I request that the questions you may have regarding the details of these investigations be reserved and addressed to Mr. Halverson or Dr. Mann.

Senator Hart. I think the request is proper.

Mr. Engman. I would like to ask, Mr. Chairman, that I be excused after giving my statement and responding to any questions you might have, so we would further eliminate possible problems.

Senator **Hart.** We had intended that.

Mr. Engman. In his prepared statement, Mr. Halverson will discuss the investigation pertaining to the competitive situation of the petroleum industry, gasoline marketing practices, and the reporting of natural gas reserves. Dr. Mann will discuss the Bureau of Economics energy studies.

STRUCTURE OF THE PETROLEUM INDUSTRY

The current investigation of the competitive situation in the petroleum industry was authorized by the Commission late in 1971. Subpenas to several major oil companies were issued early in 1972. Some were subsequently withdrawn due to strong company resistance; however, several useful responses were received.

Because of the initial resistance to the Commission's subpenas, an additional investigative strategy was employed. The staff of the Bureau of Competition sent detailed questionnaires to the larger independent crude producers, petroleum refiners, and gasoline marketers in the United States. A followup search of their files and numerous personal interviews were conducted. From August 1972 until the first part of April 1973, the staff contacted and obtained information from over 30 independent petroleum companies. In general, these independent companies voluntarily complied with the staff's requests for information and documents.

The staff obtained substantial information on the petroleum industry from published public and governmental sources. A wealth of relevant and reliable information on the structure of the industry is available from these sources. The staff collected further valuable information from the Department of Interior, the Oil Import Appeals Board, the Interstate Commerce Commission, and other Federal agencies. Various State taxing authorities and several State agencies such as the Texas Railway Commission were contacted. These governmental agencies were cooperative in providing the requested information.

To supplement the staff's understanding of the structure and operation of the oil industry, the Federal Trade Commission, on April 20, 1973, again issued subpenas—this time, ad testificandum subpenas to corporate officials of the major oil companies. Rather than merely to subpena documents, an effort was made to develop the factual information through testimony of petroleum company executives, to identify relevent documents and to make on-the-record requests for submission of such documents to the Commission. These investigative hearings began May 21, 1973, and every effort is being made to expedite them in light of the current gasoline supply situation. I have requested that a full report be submitted to me no later than July 1, including results of this investigation and any appropriate recommendations.

On December 22, 1970, on the basis of a letter from Senator Hart, complaints from gasoline marketers and the public, and other information concerning anticompetitive gasoline marketing practices, the Commission directed an investigation into the marketing practices of the major oil companies.

In January and February of 1972, the Commission conducted preliminary investigations in Florida, Missouri, Ohio, Michigan, and Wisconsin, and opened other investigations of some of the largest marketers of gasoline. The Commission opened formal investigations of the Standard Oil Co. of Ohio in May 1971, and a formal investigation of the Phillips Petroleum Co. in April 1971.

On January 18, 1973, the Commission issued a complaint against the Standard Oil Co., and its subsidiary Sohio, charging that it had violated the provision of the Federal Trade Commission Act.

On May 15, 1973, the Commission issued a complaint against Phillips Petroleum Co. The complaint resulted from an investigation of Phillips concerning the use of lease coercion and limitations on products offered for resale.

The Bureau of Competition has also initiated several investigations in Detroit. In those investigations, the Bureau of Competition has issued several subpenas for documents to two major oil companies. On April 12, 1972, the Bureau issued an extensive subpena to one major oil company, which resisted the subpena until ordered by the Commission to submit the documents. The company still has not submitted all of the requested information. The Bureau staff has held hearings, taken testimony from executives of this company in Detroit and Washington, and has conducted extensive interviews of present and former gasoline service station dealers of this company.

The Bureau initiated an investigation of another major oil company in Milwaukee in February 1972 regarding retail pricing policy. That investigation has now been shifted to Detroit. In March and April of 1973, the staff subpenaed documents and testimony from several executives of this corporation regarding their marketing practices in Detroit and other parts of the country.

In total, the Bureau of Competition has received thousands of pages of testimony, over a quarter of a million documents, and much other information in its investigation of these major gasoline marketers. After analysis of this wealth of data, the staff will recommend to the Commission such action as it deems appropriate.

REPORTING OF NATURAL GAS RESERVES

By a letter dated September 1, 1970, Senator Hart wrote to Commissioner MacIntyre indicating that there were numerous allegations that natural gas producers were collectively withholding information on new discoveries of natural gas for the purpose of obtaining higher rates from the Federal Power Commission which regulates wellhead prices of gas passing into interstate commerce. He recommended that the Commission conduct an investigation in this area to determine whether there was a withholding of gas reserves and to determine whether such withholding and delay was attributable to a combination or other conduct violative of section 5 of the Federal Trade Commission Act.

A Commission minute dated October 20, 1970, authorized and directed the commencement of an investigation focusing principally on the reporting, estimation and deployment of reserves by the natural gas industry in one selected area of the country. Southern Louisiana was chosen as the subject of this inquiry, and on June 3, 1971, the Commission approved the use of compulsory process.

After extensive negotiations with the attorneys for the American Gas Association, the field-by-field estimates of each southern Louisiana subcommittee member for the years 1966 through 1970 were delivered to the offices of Price Waterhouse & Co. in October 1971. This was the first time that the individual field-by-field estimates used by the American Gas Association to compile their annual report were revealed to any agency. Because of their confidentiality, a third-party arrangement was agreed upon whereby the documents would remain at Price Waterhouse, but Bureau of Competition attorneys would have possession of and access to the field-by-field estimates.

With information gained from numerous depositions and interviews, a comprehensive subpena was drafted and issued on November 24, 1971, to the heads of the following companies: Shell, Gulf, Texaco, Continental, Union, Mobil, Superior, Pennzoil, Standard Oil Co. (California), Standard Oil Co. (Indiana), and Standard Oil Co. (New Jersey, now Exxon). The subpena focused on offshore Louisiana.

All of the companies filed motions to quash with the last motion to quash filed on February 11, 1972. On June 27, 1972, the Commission issued its opinion denying all the motions to quash. On July 28, 1972, two of the companies filed petitions for reconsideration of the Commission's order denying the motion to quash, and three additional companies filed motions to stay the Commission's denial until the Commission ruled on the petitions to reconsider.

After the Commission's denial, extensive negotiations explaining the specifications of the subpena were conducted with most of the companies. Motions to quash were finally denied. In September, three of the companies agreed to produce the documents required by the subpena. These companies were Gulf Oil Corp., Union Oil of California, and Continental Oil Co. On November 15, 1972, the Commission authorized the General Counsel to request the Department of Justice to enforce the subpenas against six of the noncomplying companies. In December of 1972, negotiations broke down with the remaining two companies, and one of the companies that had previously agreed to submit documents in response to the subpena, elected partially to withhold some of the data called for by the subpena. On January 18, 1973, the Commission authorized the General Counsel to request action against these three companies. In March, the enforcement papers were transmitted to the Justice Department. On June 14, 1973, the Justice Department filed suit in district court for the enforcement of these subpenas.

I might add here, Mr. Chairman, we do not have the authority to enforce our own subpena and must, therefore, refer them to Justice.

Senator HART. What is your opinion as to the policy which requires the Justice Department to enforce your subpenas?

Mr. ENGMAN. We have requested the Congress, Mr. Chairman, to grant us the authority to enforce our subpenas. I have testified on that before Congressman Moss' subcommittee in the House. We are hopeful that legislation which would permit us to do this will be enacted by the Congress this year.

Mr. Halverson will be commenting more specifically on some of the preliminary results of the natural gas investigation which I understand the Bureau of Competition is now formulating.

STRUCTURE OF THE ENERGY INDUSTRY

The background of the Bureau of Economics' commitment to studies in the energy sector has been fully presented in a document made public, titled "Commission Study Alternatives in the Energy Sector: A Memorandum to the Commission by the Office of Policy Planning and Evaluation, April 22, 1971." This submission to the Commission detailed for study areas for the Bureau which received approval of the Commission in May 1971, and which are over and above the studies to which I have been referring. These are:

1. An inquiry into whether the four primary fuels—oil, natural gas, coal, and uranium—constitute one, or four, separate markets.
2. A second investigation begun in the spring of 1972, seeking to analyze the impact of oil company mergers on the potential decline in concentration resulting from the increasing substitutability among the primary fuels. The Bureau expects to submit this study to the Commission in the very near future.
3. An examination of the possible impact which structural changes resulting from oil-nonoil mergers might have on pricing behavior. Because the Bureau of Economics was not confident that there is any sound analytical means for making such a determination, the Commission decided last November not to proceed further with this study at that time.
4. An inquiry seeking to determine the link, if any, between structural changes and the pattern of R. & D. on new technologies which may transform coal into oil. The Bureau plans to begin this study in the fall of this year.

STAFF RESOURCES DEVOTED TO VARIOUS STUDIES AND INVESTIGATIONS

With respect to the study of the structure of the petroleum industry, the Bureau of Competition estimates the total cost to date at approximately $300,000. The study now requires the efforts of 2 assistant directors, 10 attorneys, 4 law clerks, and 9 economists, at a projected annual cost of about $1 million—$700,000 more than was anticipated. Present plans call for the full-time assignment of about 15 atorneys to this project in fiscal year 1974. However, this figure will be substantially larger if the Commission should decide to conduct litigation in this area. Given the fact that litigation is possible (although the Commission has made no determination yet) and the possibility of a major report to Congress in the event of enactment of S. 1570, the annual cost associated with the petroleum industry activity could be as high as $1,500,000 during fiscal year 1974.

The total cost of the Bureau of Competition's inquiries into gasoline marketing practices to date is estimated at $200,000. Six headquarters attorneys and one economist are presently assigned to these matters. One of the dealer cases is being handled by the Cleveland Regional Office, and is staffed by several attorneys. Projections for the future indicate that requirements will continue at approximately the present levels, or at a dollar cost of about $200,000 annually.

The total cost of the natural gas investigation to date is estimated at $170,000. Currently, two attorneys, one economist, and one law clerk are assigned to the project. Projected requirements for fiscal year 1974 are estimated at four attorneys, with the likelihood that as many as six attorneys will be required by fiscal year 1975 in the event that the Commission decides on the basis of information developed from the recently developed subpenas that a litigated case would be appropriate. In rough dollar costs, this would amount to about $200,000 annually.

The Bureau of Economics estimates that its work to date in analyzing the structure of the energy industry has cost approximately $100,000. Three economists are presently working full time on this project, and costs are expected to continue at a rate of about $70,000 per year for at least another year.

I am pleased to have the opportunity to be here this morning and to appear before this subcommittee, particularly before you, Mr. Chairman, since you are one of the Senators representing my home State.

I would be happy to answer any questions which you might have.

Senator HART. Thank you, Mr. Chairman.

Senator HART. First, and bearing, I think, on the general subject but seemingly remote: Any time an appropriation or budget request is up, unless it is the Defense Department or some monstrous inhaler of Federal money, the addition of $2 or $3 million sounds like a lot of money and encounters considerable resistance.

On pages 10 and 11 of your testimony you project staff resources devoted to the energy area for 1974 as about $2 million.

Yesterday the Senate Appropriations Committee did approve or request an additional $2 million, $2.6 million. The Appropriations Committee has added $2 million, which would provide about 50 more lawyers and economists to the FTC for a special task force on energy.

Of course, my purpose in asking for that additional money was to assist you in your work and speed it up; I hope it will. But I wonder whether your other resources are adequate. What is your opinion now that you have been in the Commission for a period of time as to the adequacy of your staff funding?

Mr. ENGMAN. Mr. Chairman, we very much appreciate your interest in our funding and the special effort you took to communicate that interest to Senator McGee on the Appropriations Committee.

With respect to these matters it is difficult to be precise with respect to what our needs may be in any given area. If it should happen that in one of these areas the staff should recommend to the Commission a major action sometime this summer and the Commission should determine that a major legal action of some sort should be brought, this could have a substantial impact on the manpower which will be needed.

Naturally, we would like all of the money we can have, but we don't want to use it injudiciously, and I believe the amount appropriated by the Appropriations Committee should be ample for this area of the energy industry. If we find ourselves involved in a great deal of litigation, we may need additional funds to pursue the matter. If that should happen, I would like to come back to the Congress.

With respect to the other resources available to the Commission. we were one of the few agencies granted a slight increase in personnel and money by the OMB. The House committee saw fit to take action which reduced some of this increase but I note that the Senate Appropriations Committee has restored the full amount of the increase which was approved by OMB.

We would. of course. urge that the Congress maintain the fiscal year 1974 budget which we submitted in its full amount.

Senator HART. We can't ask you to do a job unless we give you the money. I hope you will be prompt in letting us know if you believe you will need additional money down the road.

That gets us to the business of the Office of Management and Budget. Did the OMB clear the testimony that you are giving us this morning?

Mr. ENGMAN. No: it did not. I follow the practice. Mr. Chairman. of not clearing with OMB testimony which I give as chairman of an independent regulatory agency. We have on occasion in the past submitted information copies to the OMB, but I don't know whether or not my staff did so in this instance.

Senator HART. I recall the position you took in your discussion with the Commerce Committee at the time of your confirmation. You felt there was an independence that had to be respected. and you would proceed as you saw fit. whatever the OMB might think; that is good.

Was your testimony cleared with anyone in the White House?

Mr. ENGMAN. It was not cleared with anyone in the White House. The only individuals who cleared my testimony were the three fellow members of the FTC. Commissioner MacIntyre is not participating this week in our deliberations since he is resigning.

Senator HART. That is the way all independent agencies should operate; I am glad you are.

Now. with respect to the Bureau of Economics' concentration in the energy business. as I read Dr. Mann's statement. apparently a decision was made to obtain information from the public records and not from companies by way of the 6–B questionnaire or by subpena.

So 3 years after Congress has requested this study, what we are going to receive. I take it. is a distillation of public data. That will be the basis of the report.

Now. the public data does not tell the full story. If it did. there would be no quarrel with that approach. But as we have learned over the last several years, the control of reserves. whether we are talking about petroleum or uranium or coal or gas or whatever, will ultimately determine who controls the energy industry.

I take it that your study will not contain that information.

Mr. ENGMAN. I must confess. first of all, Mr. Chairman. these matters took place before I was chairman of the Commission. Therefore. I don't have firsthand information. I have not seen the proposed report and I would like to defer my personal judgment on that report until I have had an opportunity to review it. I expect we will have it next month. I think the Commission itself will take the same approach and we will want to be certain in our own minds that the report is a valid report.

I have no reason at this point to surmise that it may or may not be based on valid data, but I do appreciate your comment that on some occasions reported data may not be totally accurate.

Senator HART. Let me make one other comment.

Dr. Mann sets out production concentration ratios in the oil and natural gas production field. He comes up with a figure in the general area of 25 percent of concentration ratios.

Chairman Nassikas of the Federal Power Commission gave us some tables and we have had testimony from power economists. They point to four-firm area-by-area concentration of natural gas as approximating 95 percent. This discrepancy is dramatic both in terms of justification and also importantly in the situation. I think this illustrates the need for the Trade Commission structure study to get the real data directly from internal company documents.

What do you think your chances are of doing that?

Mr. ENGMAN. I suppose that due to the extent to which we meet resistance we will have to go through the subpena route once again.

I would like to say, Mr. Chairman, that the concentration ratios are important, but as you know, numbers can be developed and utilized in a number of different ways.

The fact there sometimes is more than one ratio may be justifiable in that those ratios are being used for different purposes.

If we are looking at the possibility of whether a certain approach should be taken to, say, mergers between two segments of an industry, it is then necessary to look and see whether that industry uses two kinds of fuels. Where we are looking at some other aspects for other purposes, it might be appropriate to use a concentration ratio or market definition which is somewhat different. At this point, I would prefer not to comment on the approach taken thus far.

I can assure you that we are going to be very concerned about getting accurate information and information which will and can provide a meaningful basis for such action as may be appropriate.

Senator HART. But the need to have available the reserves is critical. We are in agreement on that.

Mr. ENGMAN. I don't think there is any disagreement.

Senator HART. In the search for the truth here you may run into delaying tactics, you may have subpena problems, you may have OMB problems clearing questionnaires and so on. I know that we are going to add time to the development of the report, and yet I think that the sooner we can make the turnaround and go after the true figures the better, and the published report based on published production data is important.

I would just as soon delay the report until it is in a position to reflect the true figures.

If the task force appropriation clears the Senate and there are no impediments to your getting the information for this study from the company, is it possible that you will be able to report by January 1, 1975? That is the date we built into the task force appropriation.

Mr. ENGMAN. I see no reason at this point to believe we would not be able to report by that date, Mr. Chairman. I might be contradicted by our staff people. However, I think it is good to have a club over their heads.

I should say that I think with the amount of investigation which is already proceeding and the amount of information that has been and is being obtained, we should be in a position to move very promptly in this area. I would certainly think since it is one of the critical issues which faces this country today, we must give it a very high priority.

Senator HART. Your actions since you have been in office reflect that position.

I want to talk at least about some housekeeping aspects of the investigation of the reserves reported by the American Gas Association. Because you are going to have to judge that, I do not intend to get into substance and if any of my questions appear to involve substance, just say so.

As you know, our interviews of your staff have spelled out the controlling and have specifically suggested that an 11-month delay resulted from delay within the office of your general counsel. Your own testimony indicates that the Commission authorized the general counsel to request subpena enforcement by the Justice Department in November of 1972.

As we understand it, that request was not even transmitted to the Justice Department until some 4 months later. Is that the formal procedure?

Mr. ENGMAN. First of all, I don't know that one could characterize anything as a formal procedure, Mr. Chairman. This is a very difficult area, and there may have been some difficult legal questions involved.

However, I don't think this kind of delay is justifiable in an instance where there is a critical need for the facts. As I indicated in my comments, I have instructed our staff, and particularly the Bureau of Competition, that all resources and manpower that we have should be devoted to move this as rapidly as possible.

Senator HART. Were matters in connection with this study handled by several people in the counsel's office or was the responsibility that of one person?

Mr. ENGMAN. It would have been the responsibility of a group of people. During this period of time we had some compliance and the situation changed to some extent. One of the companies which indicated it would comply subsequently did not comply totally, and in two other instances, as my statement indicated, there were some changed circumstances. It does illustrate, I think, the difficulty of the present procedure: If the Commission had had the authority to enforce its own subpenas, we would have moved immediately forward rather than taking additional time to prepare the material for Justice, and then bringing their people up to date on what the problem was.

Senator HART. As I pursue this, I want to make clear that, in the judgment of the subcommittee, the performance by the Commission itself—you as Chairman and your Commission members—has been breakleg.

We are trying to find out why down below in your staff there is——

Mr. ENGMAN. I think they now have the word.

Senator HART. Your testimony indicates that the Commission authorized the investigation on October 20. The compulsory process was approved in June 1971.

Then the Bureau of Competition felt that the AGA response was inadequate and that the subpenas should be issued and that recommendation. I take it, was rejected; is that correct?

Mr. Engman. Which particular recommendations are you referring to, Mr. Chairman?

Senator Hart. My notes say that the recommendations for subpenas were rejected. The staff tells me that is not the point and I will ask Mr. Bangert to develop——

Mr. Bangert. Mr. Chairman, it is our understanding that there was a recommendation made to the Commission to close the case on the basis of the AGA response, but the Commission, in fact, decided that it would not close the case but would go forward with it using compulsory process.

If you could provide us with a chronology of what happened between October 20, 1970, and the date when the compulsory process was authorized, including the names of the various staff members that were involved in the project, I think that will help us in our housekeeping and clear up the record.

Mr. Engman. We will be very happy to do that. I want to state it is my understanding that at no point in this process has the Commission taken any action which would have turned off or changed or slowed down the course of its investigation.

[For the information requested, see exhibit 6 at the end of Mr. Halverson's testimony.]

And since I have been personally aware of what was going on that has been the case.

Mr. Bangert. That happened, I believe, before you became Chairman.

Mr. Engman. I don't know what happened in 1970, but we will provide that information to the subcommittee.

Senator Hart. Thank you.

Would you review the files to determine whether there were any instances or occasions when any personnel from the Federal Power Commission sought to curtail or persuade you to close down your investigations?

Mr. Engman. We will be happy to provide that information. You may be able to address that question with more specificity to Mr. Halverson, who has a little longer tenure with the Commission than I.

[For the information requested, see exhibit 6 at the end of Mr. Halverson's testimony.]

Senator Hart. Yesterday the Power Commission Chairman repeated his position that we deregulate the price of wellhead gas with respect to new gas.

We have read your analysis which opposes deregulation. Has the Commission acted on this recommendation? If you have, would it require a submission again to OMB?

Mr. Engman. No, any statement which the Commission would present to the Congress would not require OMB clearance.

The Commission has not actually received the recommendations in that area from the staff at this point.

I would say that to the extent there is information contained in some of the ongoing investigations which may have a bearing upon that, I would be cautious about expressing an opinion personally or on behalf of the Commission.

Senator HART. That is good enough. I have one other thing which reaches way out.

Since 1965 the Trade Commission has been investigating the distribution of automobile replacement parts. Since 1968 this subcommittee has been urging the Commission to come to some kind of conclusion one way or the other. Are there, or are there not anticompetitive practices associated with captive crash parts, and are there more subpenas outstanding that the automobile companies are moving to quash? I am talking about an 8-year-old investigation. Please check on the progress when you get back and tell me if that is as expeditious a movement as possible or whether something can't be done to make it move more expeditiously.

Mr. ENGMAN. You raise an interesting point, Mr. Chairman. One of the difficulties I have had to adjust to in coming to work for the Government is that there are many delays that seem to be intolerable.

As a matter of fact, on this subject I talked to our general counsel last week and raised the question as to what was the progress in this area. I have scheduled a meeting for this afternoon with the director of our Bureau for a complete report as to what the problems are and what the timing will be in the future.

Senator HART. That is a happy coincidence and we will await your word.

[For the information requested, see exhibit 6 at the end of Mr. Halverson's testimony.]

Mr. Chumbris.

Mr. CHUMBRIS. Chairman Engman, it is a pleasure to welcome you here this morning. I am sorry none of the minority members were able to be here, and I am sure they would offer you their welcome also.

Mr. ENGMAN. I understand there are some other matters going on currently which require their presence.

Mr. CHUMBRIS. In light of your comment that you would not submit to the OMB statements for hearings in which your Commission testifies, I think it is a good time again for us to bring up a point which has been a sore spot in many of our other hearings.

I think it is significant now that you are starting a new practice that perhaps you can lead the way in this, also.

It is really a very difficult thing for a committee to hold a hearing on a subject matter as important as this one, and to have to consider four statements; one is 106 pages, another is 60 pages, another is 75 pages. It is very difficult for us to receive those statements after a full day's hearing which ended at 6:18 last night, and then to have to go home and read 240 pages and make any sense out of it and be able to discuss it thoroughly. We have talked about this many times. I hope that your Commission will lead the way in seeing that when a statement is going to be presented before this subcommittee, not only will it follow the 24-hour rule that we have, but perhaps follow a 72-hour rule. This really should be invoked so that all of the Senators as well as their staff can go through these statements very, very carefully.

If we are going to get to the nitty-gritty of this big issue, we can't do it on the happenstance of getting a statement and not having the opportunity to digest it and ask the questions that we should be asking and not have to go back to the industry or the agency.

I know it is not a nice thing to say here, but we have said it over and over again. I am going to recommend to my ranking member—and we have done this in the past—that if we do not get a statement within 24 hours of the witness' appearance, he is going to be required to wait another day. We have done that during several hearings.

As a matter of fact, Chairman Nassikas was threatened with that the last time he appeared before us.

I think it is something that has to be mentioned, and you have set a good example by the fact that you are not going to submit it to OMB, because Government agencies have used the OMB as a reason for not getting their statements in on time. I want everyone who hears my voice and reads the record to know that I am going to exercise that 24-hour rule, and if we have anything to say in the next executive session, I think we are going to have to increase it to 72 hours.

Notice is given for some of these hearings almost a month before we hold the hearing. I can't see any reason why we can't have that statement ahead of time.

Mr. ENGMAN. I appreciate your statement. I only hope the record shows that the 106-page document is not ours.

Mr. CHUMBRIS. It is not yours.

Senator HART. We are just bouncing off you a point that bothers us all of the time.

I am in the process of trying to prepare for a 1-hour debate on the floor on an entirely different matter and I wish we had different procedures all the way around.

Thank you very much for a very frank and open and instructive statement.

Mr. ENGMAN. Thank you very much. I am very happy to have been here.

[The following was received for the record. Testimony resumes on p. 223.]

MATERIAL RELATING TO THE TESTIMONY OF CHAIRMAN ENGMAN

Exhibit 1.—FTC Response to Senator Hart's Request for Reports

FEDERAL TRADE COMMISSION,
OFFICE OF THE GENERAL COUNSEL,
Washington, D.C., June 19, 1973.

Hon. PHILIP A. HART,
Chairman, Subcommittee on Antitrust and Monopoly, Committee on the Judiciary, U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: This is in response to your letter of June 5, 1973 to Chairman Engman requesting reports from the Federal Trade Commission concerning:

1. The Bureau of Competition's investigation of the natural gas reserve reporting practices of the American Gas Association and the oil and gas companies;
2. The Bureau of Economics' energy industry structure study;
3. The Bureau of Competitions' investigation of gasoline marketing practices; and
4. The Bureau of Competitions' investigation of the competitive situation in the petroleum industry.

Pursuant to discussions with your staff, the enclosed reports are in response to that request and are submitted as background material for the Committee and not for public release.

On the basis of discussions between your staff and Federal Trade Commission staff, those sections of one of the reports that would be in appropriate areas for interrogation of Federal Trade Commission witnesses in your planned hearings have been bracketed with red pencil. Only such material that would reveal the strategy of the Commission in developing its investigation or contain detailed information taken from competitively sensitive company documentation have been so bracketed.

Sincerely,

Ronald M. Dietrich,
General Counsel.

Enclosures: (3)

Enclosure 1

Response to Senator Hart—Federal Trade Commission Investigation of Reporting of Natural Gas Reserves

This report is in response to a June 5, 1973, letter from Senator Philip A. Hart to Chairman Lewis A. Engman. That letter requested information on all the energy investigations being conducted by the Federal Trade Commission. This memorandum specifically relates to the Bureau of Competition's investigation into the reporting of natural gas reserves which is styled *In the Matter of The American Gas Association, et al.*, File No. 711 0042. Senator Hart asked for:

1. A detailed chronology of all actions taken from receipt of my letters to date, showing the progress of each investigation or study, each step taken, and the reasons for any delays encountered.
2. A detailed description of the study or investigatory methodologies and techniques used in each of these studies or investigations, i.e., was material obtained from companies, governmental agencies, public sources, etc., and the reasons for the methodologies and techniques selected.
3. A detailed description of the working relationships between the FTC and all other federal agencies or departments having knowledge or information bearing on these areas, i.e., the extent of assistance sought and cooperation received from the Geological Survey, the Federal Power Commission, etc.
4. Most importantly, your preliminary conclusions, or those of the staff, with respect to each of the studies and investigations undertaken should be provided based upon the work completed to date.

The report consists of three sections; (I) The History and Purpose of the Investigation, (II) Analysis of Documents Received in Response to the Subpoena, and (III) Preliminary Conclusions.

I. HISTORY AND PURPOSE OF THE INVESTIGATION

By a letter dated September 1, 1970 Senator Hart wrote to Commissioner MacIntyre indicating that there were numerous allegations that natural gas producers were collectively withholding information on new discoveries of natural gas for the purpose of obtaining higher rates from the Federal Power Commission which regulates wellhead prices of gas passing into interstate commerce. He recommended that the Commission conduct an investigation in this area to determine whether there was a withholding of gas reserves and to determine whether such withholding and delay was attributable to a combination or other conduct violative of Section 5 of the Federal Trade Commission Act. On October 13, 1970 the Secretary of the Commission replied that "in order that the possibility of collusion or other unlawful conduct in this field may be more fully explored, we have today directed our staff to commence an investigation which will focus principally on the reporting, estimation, and deployment of reserves by the Natural Gas Industry in one selected area of the country." A Commission minute dated October 20, 1970 authorized and directed such an investigation to commence. Pursuant to this minute, a memorandum initiating investigation was filed on November 4, 1970 charging American Gas Association et al. with collusive action in the solicitation and reporting information pertaining to reserves in violation of Section 5 of the Federal Trade Commission Act.

In the early part of the investigation, it was learned that the American Gas Association, through its Committee on Natural Gas Reserves was the only agency reporting proved reserves of natural gas for the entire United States. Ten subcommittees had been created by this Committee to report proved reserves of natural gas for the various producing regions in the United States. Because of the large potential reserves in the South Louisiana area and because there had been several allegations disputing the accuracy of the reported reserves for the South Louisiana area, it was decided to conduct a "pilot" investigation of the actual operation of the South Louisiana Area Subcommittee. A letter was directed to Mr. John C. Jacobs, Jr., Chairman of the AGA Committee on Natural Gas Reserves on December 24, 1970 requesting detailed information concerning the operation and procedures of this Subcommittee. Partial responses were received from this initial letter of inquiry indicating that the Subcommittee was composed of 11 members, all of whom were full-time employees of major natural gas producers.

Because the Subcommittee was composed of employees of major producers and because responses to the Bureau of Competition's inquiries were inadequate, it was decided that the soundest procedure would be to issue investigational subpoenas. On March 16, 1971, the Bureau of Competition requested an approval from the Commission for a resolution directing the use of compulsory process. On April 8, 1971 the Bureau of Competition was directed to advise the Commission as to whether the information to be developed from the use of compulsory process was necessary to the public interest and whether the individuals were likely to refuse to testify or provide such information on the basis of the privilege against self-incrimination. The Commission was concerned lest they be inadvertently granting immunity under Title II of the Organized Crime Control Act to either of the individuals or the companies involved. After these objections were met the resolution was approved by the Commission minute dated June 3, 1971.

Depositions were taken in order to facilitate the drafting of a subpoena. It was learned that each Subcommittee member was assigned fields in which his employer was the major producer. This member would compile reserve estimates for the fields assigned to him by the Chairman of the Subcommittee. The only review of each member's estimates is by fellow Subcommittee members. Even this review is limited in the sense that Subcommittee members only see the final estimate for any particular field and they do not see the underlying data and hence are not in a strong position to judge accuracy. The Subcommittee Chairman aggregates these estimates into a regional total and then submits that total to the main committee. The Committee on Natural Gas Reserves for the American Gas Association compiles the regional totals from each Subcommittee and then annually publishes the total proven natural gas reserves for the United States.

During this period of the investigation, the various Federal Power Commission proceedings concerning the South Louisiana area were also reviewed. In September, 1968 the Federal Power Commission set rates for South Louisiana which were based on cost plus a fair rate of return. These cost-based rates were considerably lower than those sought by industry. In its September 1968 decision the Federal Power Commission invited petitions to reconsider rates applicable to Offshore South Louisiana. In January of 1969 certain producers requested that the South Louisiana rate proceeding be reopened to receive additional evidence regarding changes in supply-demand relationships. On March 20, 1969, the FPC ordered an investigation and proposed rulemaking, styled AR69–1, into rates for Offshore South Louisiana. The FPC made it clear that the supply of reserves would be used in their decision. In May of 1969 the AGA reported an unprecedented event—an actual decline in proven reserves, occurring in 1968. This was the first AGA report to follow the FPC decision setting low rates in South Louisiana. The AGA report did not reflect declining reserves in South Louisiana, during 1968, however. The FPC staff implemented the March 20, 1969 Order by issuing a questionnaire on August 14, 1969 requiring detailed information on reserves in Offshore South Louisiana. The producers resisted answering this questionnaire. On December 15, 1969 the FPC extended AR69–1 to all of South Louisiana but limited the March 20, 1969 Order as it related to staff investigation of reserve data to "producer data as to volumes of reserves in the Offshore area not committed to interstate pipelines." In May 1970, the AGA issued a report covering 1969 reserves—this time both total United States and total South Louisiana reserves declined from the levels of the previous years. Reserve figures beyond 1969 was not considered in AR69–1. On July 16, 1971 the Federal Power Commission issued its Opinion in AR69–1, substantially increasing the rate allowed. In finding a shortage of gas supply to justify increasing the rate, the Opinion replied principally on AGA reserve data which it held to be "reasonable reliable for the purposes used herein." The Federal Power Commission also said:

"Our duty is to take all action we believe necessary to reverse the down trend of the exploration and development effort, thereby to increase the likelihood of augmenting the national inventory of proved reserves for natural gas. We would be derelict—we can think of no softer word—if we were to be guided by the legalisms of the past in seeking solutions to the problems that have grown like barnacles as this case has aged and its size has mounted."

After extensive negotiations with the attorneys for the American Gas Association, the field-by-field estimates of each South Louisiana Subcommittee member for the years 1966 through 1970 were delivered to the offices of Price-Waterhouse & Company in October of 1971. This was the first time that the individual field-by-field estimates used by the American Gas Association to compile their annual report were revealed to any agency. Because of their extreme confidentiality a third-party arrangement was agreed upon whereby the documents would remain at Price-Waterhouse but Bureau of Competition attorneys would have possession of and access to, the field-by-field estimates.

By letter of July 22, 1971, an attempt was made to secure certain reserve information pertaining to South Louisiana that was contained on Form 15 Reports filed with the Federal Power Commission. Form 15 Reports are filed annually by interstate natural gas pipeline companies and reflect the remaining recoverable saleable gas reserves committed to, controlled by, or possessed by the reporting pipeline company. The Form 15 was designed to aid the Federal Power Commission in the processing of certificate applications made by the pipeline companies and to maintain surveillance of the gas supply of the pipeline companies. Because the General Counsel of the FPC had on December 1, 1970 requested the FTC attorneys to inform him in writing of any request for data or interviews, this letter was written to Mr. Gordon Gooch. Mr. Gooch responded by letter of August 9, 1971 stating *inter alia*.

"The estimated cost for the manual portion to respond to your request is in the range of $25,000, exclusive of the cost of programing, computer time, and related verification· We would need appropriate assurances from your Executive Director that the Federal Trade Commission would reimburse us for all costs incident to the study before undertaking it."

The request of July 22, 1972, in retrospect and out of fairness to Mr. Gooch, asked for much detailed information that would indeed have been difficult to provide.

During the course of this investigation, the Bureau of Competition did obtain through other sources certain data from Form 15 Reports. A comparison between the AGA field-by-field figures and data from these Form 15 Reports disclosed numerous instances in which companies have reported reserves on Form 15's that are twice the quantities of reserves reported for such fields by the AGA.

With information gained from numerous depositions and interviews, a comprehensive subpoena was drafted and it was issued on November 24, 1971 to the heads of the following companies: Shell, Gulf, Texaco, Continental, Union, Mobil, Superior, Pennzoil, Standard Oil Company (California), Standard Oil Company (Indiana), and Standard Oil Company (New Jersey) (now Exxon). The subpoena focused on Offshore South Louisiana and revolved around one central premise which is that natural gas producers, for a variety of reasons, make estimates of proven gas reserves. Companies make estimates of proven natural gas reserves in situations such as (1) bidding on or nominating leases, (2) deciding whether to erect a permanent platform, (3) compiling or inventorying total company reserves or supply (4) negotiating or contracting for the sale of natural gas, or for the joint or common exploration, development, production, purchase or sale of acreage, or for obtaining bank loans, and (5) filing depreciation expense schedules with Internal Revenue Service to name just a few of the situations. Specification G was therefore written to cover documents either received or written by the natural gas producers between January 1, 1962 and December 31, 1970 which contained estimates of the volume of natural gas present. Documents containing estimates for all of South Louisiana, documents containing estimates for all of Offshore Louisiana, and documents containing estimates for specific fields, portions of fields, leaseholds and portions of leaseholds in Offshore Louisiana were called for by Specification G. The subpoena's 11 other specifications were designed to provide a comprehensive picture of each company's various operations in the South Louisiana area and to provide a means to verify the estimates submitted.

The theory of the investigation is to compare the reserve estimates used by the companies in their internal purposes with the estimates submitted to the American Gas Association that were relied on by the Federal Power Commission.

In other words the investigation was not attempting to make new estimates of the proved reserves in South Louisiana but was instead attempting to get at reserve estimates already prepared. The various independent surveys of natural gas reserves conducted by the Federal Power Commission and others have always sought data from the natural gas producers in order to compile original reserve estimates of the various fields. These types of surveys could be successful if it were possible to obtain either all the data from the various companies or if it were possible to obtain data from other sources. It was our experience that raw data necessary in order to make original estimates of natural gas reserves cannot be obtained outside of company sources and that reliance on company sources to provide all the raw data needed is misplaced.

After the subpoenas were issued on November 24, 1971, various extensions in the 20-day time period allowed to respond or to file motions to quash the subpoena were granted. All of the companies filed motions to quash with the last motion to quash filed on February 11, 1972. On February 17, 1972, the Bureau of Competition's attorneys on the case submitted a memorandum to the General Counsel of the Federal Trade Commission recommending denial of the motions to quash. On June 12, 1972 the General Counsel submitted its recommendations to the Commission to deny the motions to quash the subpoenas. On June 27, 1972 the Commission issued its opinion denying all the motions to quash. All of the companies were informed of the denial and were given 20 days to respond to the subpoena. Two of the companies, on July 28, 1972, filed petitions for reconsideration of the Commission's order denying the motion to quash and three additional companies filed motions to stay the Commission's denial until the Commission ruled on the petitions to reconsider. The last motion filed was August 11, 1972. An August 25, 1972 the Commission without opinion denied the various petitions for reconsideration.

After the Commission's denial, extensive negotiations explaining the specifications of the subpoena were conducted with most of the companies. In September. three of the companies agreed to eventually produce the documents required by the subpoena. These companies were Gulf Oil Corporation, Union Oil of California and Continental Oil Company. In mid-October, 1972, it was felt that six of the remaining eight companies would not comply with the subpoena without a court order. Accordingly, on October 26, 1972, the Bureau of Competition submitted a memorandum to the General Counsel of the FTC requesting enforcement of the subpoena against these six companies. On November 15, 1972 the Commission authorized the General Counsel to transmit the enforcement papers to the Department of Justice. In December of 1972 negotiations broke down with the remaining two companies and one of the companies that had previously agreed to submit documents in response to the subpoena elected to partially withhold some of the data called for by the subpoena. Subpoena enforcement action were then recommended by the Bureau of Competition against these three companies. On January 18, 1973, the Commission authorized the General Counsel to transmit these enforcement papers to the Department of Justice. On March 2, 12, 14, 15, 16, and 22, 1973 the enforcement papers were transmitted to the Consumer Affairs Section of the Anti-trust Section of the Justice Department. On June 14, 1973 the Justice Department filed suit in the District Court for the enforcement of these subpoenas.

Between the time the Justice Department received the enforcement papers and June 14, 1973, attorneys representing the resisting companies held three meetings with the Justice Department. The attorneys for the producers cited the case of *Guignon* v. *FTC* (C.A. 8 1968), 390 F. 2d 323, as authority for their proposition that the Justice Department must consider the merits of the case before authorizing the filing of enforcement papers in District Court. The attorneys then presented the same reasons for denying enforcement as they had presented to the FTC a year and one half ago. One reason, which has been advanced consistently since the issuance of the subpoena, relates to the Federal Power Commission's National Gas Survey. Part of this survey entitled "National Gas Reserves Study" was finally released on Thursday, May 16, 1973. Even after the subpoena enforcement action was filed, a motion was received by the Secretary of the FTC asking for a stay of the investigation due to issuance of this study.

The National Gas Reserve Study presented an estimate of the proved reserves of natural gas in the United States as of December 31, 1970. In arriving at this estimate, each field in the United States was not independently estimated. Fields that were reported by the American Gas Association to contain more than 400 BCF of gas, defined as the "certainty sample," were each examined but fields reported by the AGA as less than 400 BCF were stratified in six classifications for limited random sampling.

Our review of AGA estimates has indicated that the only fields reported as containing more than 400 BCF of gas are those that have been on production for a long time. It has also revealed that the fields reported to contain relatively small amounts of reserves are quite often the fields that are most seriously under-reported. The procedure for identifying those fields that belong in the certainty sample and those fields that belong in the six random sample classification is stated on page 21 of Appendix V of the study.

"Assign sample fields to the same strata as originally assigned according to its AGA reserves. That is, the AGA reserve figure defines the strata regardless of the independent reserve estimate."

Reliance on AGA figures places those fields that are most likely to be under-reported into the random sampling category. These fields were thus much less likely to be examined.

The distinction between AGA figures and FPC figures is further blurred by the fact that employees of producers also had a large input and influence in the study. The full extent of industry participation in making the estimates used in these studies is still unknown but the extent to which industry participated in setting up the procedures for making up the estimates is known in part.

By Order of April 6, 1971, the FPC established three advisory committees. The relevant one for this discussion is the Technical Advisory Committee—Supply. This committee is headed by Myron A. Wright, Chairman of the Board of Humble Oil Refining Company (now Exxon USA) with Dr. Paul J. Root, Technical Director National Gas Survey, serving as the FPC's Coordinating Representative and Secretary. On December 21, 1971 a Supply—Technical Advisory Task Force—Natural Gas Supply was announced by Order of the FPC. This Task Force is organizationally responsive to the Technical Advisory Committee—Supply. The Task Force Director is Ralph W. Garrett, Exploration Analysis Manager, Humble Oil and Refining (now Exxon USA). The Deputy Director is Worthy Warnack, Geologist, Humble Oil and Refining Company (now Exxon USA). Task Force members include employees of Phillips Petroleum Company, Union Oil Company of California, Gulf Oil Corporation, Texaco Incorporated (California), Mobil Oil Corporation, Shell Oil Company, Atlantic Richfield Company, Amoco Production Company, and United Gas Pipeline Company. Dr. Root is also the Coordinating Representative of this group.

This Task Force and the Advisory Committee—Supply were responsible for formulating the procedures used in the Study. Although the Task Force was first authorized on December 21, 1971, the minutes of an October 21, 1971 meeting of the Executive Adivsory Committee indicate that the Task Force on Supply had its first meeting on September 15, 1971. The Task Force had an indeterminate number of meetings between September 15 and December 21, 1971. At least one of these meetings was held in Humble's Office in Houston. No minutes are available for these meetings.

By another order, also on December 21, 1971, the Commission announced the procedures of the Study. The third paragraph is particularly important, "The Task Force on Natural Gas Supply to the Survey's Supply Technical Advisory Committee recommended procedures for such a survey and analysis at its December 14, 1971 meeting." Thus, in addition to this September 15 meeting, there was a December 14 meeting. There are no minutes available for the December 14 meeting of the Task Force and so it is impossible to tell whether the FPC had any input into the procedures as adopted.

In addition to these general criticisms of the survey, it is noted that the FTC's investigation covers from 1962–1970 where the FPC's study only deals with 1970. The significance of the FTC's time period is that trends can be noted. Comparison between company documents containing estimates and the AGA estimates from the year 1962 to 1970 have already revealed that although there has always been a discrepancy between the figures, this discrepancy significantly increased in 1968 and 1969, the crucial years in our study because of the reliance by the FPC upon 1969 AGA data in their area rate case for South Louisiana.

Another reason why the study is irrelevant to our investigation is that there are over 200 fields in Offshore South Louisiana and the FTC's investigation is seeking documents showing company reserve estimates for each one of these fields. The FPC's study sought raw data for 24 Offshore South Louisiana fields, 20 of which were fields in the certainty sample. As discussed above, these fields are the least likely to be under-reported. Only four of the remaining fields were randomly selected. The Bureau of Competition requested the Federal Power Commission to supply the reserve estimates it arrived at for the 24 fields. To date, no definitive response has been received. Although we would welcome these estimates as an aid to our investigation, it must be reemphasized that the Federal Trade Commission is not seeking to make original estimates of these fields. We have asked *inter alia* for those company documents containing reserve estimates. Naturally, to insure that we will receive all the pertinent documents, we have also asked for the raw data behind these estimates. The FPC, on the other hand has attempted to make their own estimates. Making an independent estimate places one at the mercy of the producers because only the producers have access to the raw data and it is very difficult to determine the completeness of the raw data disclosed for each field.

II. ANALYSIS OF DOCUMENTS RECEIVED IN RESPONSE TO THE SUBPOENA

On November 20, 1972 Gulf Oil Corporation submitted over 12.000 documents in response to the subpoena. These documents were examined in detail and on March 20 and March 21, 1973 various witnesses from Gulf Oil Corporation came to the Federal Trade Commission for a return hearing. During this recorded hearing, questions concerning the adequacy of the search and the meaning of the documents submitted were asked of the various witnesses. On February 27, 1973 Union Oil Company of California submitted in excess of 14,000 documents in response to the subpoena and on May 8 and 9, 1973 a return hearing was held. On April 25, 1973 Continental Oil Company submitted over 28,000 documents in partial response to the subpoena. These documents have not as yet been completely examined and the return hearing is schdeuled for July 31 and August 1, 1973.

The documents received from Union and Gulf do not, of course, provide a complete picture of the reserve reporting procedures of the American Gas Association. A complete assessment is difficult to make until all the responses have been received from the other companies subpoenaed. Several preliminary indications, applicable to the Offshore area, have however become apparent.

It was found that proved reserves is a term used industry-wide and that the definition for proved reserves utilized by the AGA is also the definition employed by the industry. It was also found that the submitting companies utilized estimates of *proved* reserves for many purposes. One such purpose is for making an annual report of proved reserves in the South Louisiana area for the use of corporate headquarters. The estimates of proved reserves that appear on in-house annual reports of this character are sometimes called "book" reserves and are usually broken down into estimates of the various leases the company owns. There are many other uses of proved reserves other than for in-house corporate reporting. In fact it was found that producers usually make a separate estimate of proved reserves for a particular field, lease, well, etc., even if an estimate for that particular field is available in the annual in-house reports. Apparently producers rarely, except for tax purposes, go to the estimates contained in their in-house annual reports. For instance, when a producer has drilled a well on a particular trace and is considering spending millions of dollars to place a platform on the tract, this expenditures quite naturally has to be fully justified so a new estimate of the reserves in that tract is made. This estimate often is broken down into several categories of reserves with proved reserves being one of the categories. Another example is when a company wants to sell reserves in a certain lease to a pipeline company. The contract that has been used for such a sale sets a certain minimum and maximum daily quantity that a pipeline company agrees to take and that a producer agrees to provide. These quantities are oftentimes determined by a formula that is dependent upon the amount of proved reserves that are estimated in that lease. Documents commenting on these estimates break down into great detail the amount of testing done on each well to come up with estimates of proved reserves. Another use of proved reserves in at least part of the time period between 1962 and 1970 is for what is known as carved out production payments. In general terms, the carved out production payment is a method for producers to anticipate income from a given lease. The future production for a given time period is in effect sold, usually to a bank in return for needed capital. Estimates of the proved reserves in the particular lease are required by the various banks.

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The estimates of proved reserves for a given lease that are reflected in the in-house annual reports have been found to be lower than estimates of proved reserves that are used for other in-house purposes. Sometimes the difference is very significant amounting to over 200%. Both because of this trend, and because of the tax-related purposes of the in-house compilation of reserves, it has been surmised that at the very least the in-house corporate compilation of proved or 'book' reserves are conservative.

Notwithstanding the conservative nature of these estimates, comparison between these in-house compilations of lease-by-lease estimates of proved reserves with estimates submitted by members of the very same companies to the South Louisiana Subcommittee of the American Gas Association has releaved very significant discrepancies between the estimates. The estimates of proved reserves submitted to the South Louisiana Subcommittee of the AGA have been found to be significantly lower than the estimate of proved reserves reflected in the corporate compilation. Some of the estimates are approximately equal, but no corporate estimate has been found to date that is lower than the estimate submitted to the Subcommitee. * * *

The Bureau's investigation has also uncovered numerous instances in which apparently substantial amounts of proved reserves of natural gas have been discovered in the Federal Offshore area and not produced. * * *

III. PRELIMINARY CONCLUSIONS

Complete responses from all the companies subpoenaed would provide a more accurate assessment of the reserves reporting procedure of the American Gas Association. From the documents received and the investigation to date it appears that there has been serious under-reporting of proved natural gas reserves. Although no conclusive evidence has been found as yet of an actual conspiracy to under-report reserves, the investigation has revealed that the procedure for reporting reserves through a subcommittee composed of employees of major producers could be conducive to such a conspiracy.

Enclosure 2

RESPONSE TO SENATOR HART—FEDERAL TRADE COMMISSION ENERGY INDUSTRY STRUCTURE STUDY

The background to the Bureau of Economics' commitment to studies in the energy sector has been fully presented in a document made public, titled "Commission Study Alternatives in the Energy Sector," a memorandum to the Commission by the Office of Policy Planning and Evaluation, April 22, 1971. This submission to the Commission detailed four study areas for the Bureau which received approval of the Commission in May, 1971. These are:

(1) An inquiry into whether the four primary fuels, oil, natural gas, coal, and uranium, constituted one, or four separate, markets. The study was essential to a determination of whether the oil company mergers with nonoil fuel producers were horizontal or conglomerate in nature. It took six months and concluded that the primary fuels, at least as inputs to the electric utility sector, constituted a single market and therefore, ". . . mergers between petroleum companies and firms producing or owning reserves of other fuels should be considered horizontal acquisitions."[1] This conclusion indicated that the level of concentration in the energy sector would decline unless the major firms in one of the primary fuels were acquiring the dominant companies in the other fuels.[2] This is the focus of the second study.

(2) This investigation, begun in the spring of 1972, sought to analyze the impact of the oil company mergers on the potential decline in the concentration resulting from the increasing substitutability among the primary fuels. It will be transmitted to the Commission next month with a recommendation for publication. It will be discussed in more detail below.

(3) The third effort would attempt to relate the structural changes resulting from oil-nonoil mergers on pricing behavior.

(4) The fourth inquiry would seek to determine the link, if any, between the structural changes and the pattern of R&D into new technologies which may transform coal into oil.

These studies were undertaken in sequence. The first was published in February 1972. The second is nearly ready for Commission consideration. There are two salient points about the second study. First, the decision was made to estimate concentration levels and trends in terms of production rather than reserve data. Second, this decision meant that the study relied almost entirely on public data,[3] and therefore is subject to several caveats. These two issues will be discussed in turn.

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[1] *Interfuel Substitutability in the Electric Utility Sector of the U.S. Economy,* p. 82.
[2] *Ibid.,* Table 48, p. 84.

A complete discussion of the issues concerned with the measurement of concentration in terms of production as opposed to reserves is contained in the above-cited memorandum (pp. 11–29). Measurement on the latter basis is clearly preferable in circumstances where current production does not, as in the primary fuels, translate on a one-to-one basis into reserve ownership. The future competitive posture in the primary fuels depends upon who has the reserves.

As the memorandum indicates, measurement of concentration on the basis of reserves would certainly require the use of 6(b) questionnaires. Such a massive survey, seeking very sensitive data from individual companies, would severely strain Commission resources.[4] The 6(b) questionnaires requires preparation, clearance by OMB, and compliance by the respondent companies. The last would not come easily, but only after lengthy court battles, often requiring enforcement by the Department of Justice. It is not unrealistic to say that had the second energy study gone this route, we would be fortunate to have sufficient compliance two years from now to begin our analysis.[5]

There was a potential short-cut, at least with respect to the reserve data in the uranium sector. As the Director, Bureau of Economics, testified before the Subcommittee on Special Small Business Problems of the House's Select Committee on Small Business,[6] he and staff met with representatives of the AEC to determine whether the Bureau could obtain production and reserve data for firms active in uranium mining and milling. They were told that both data items were submitted voluntarily to the AEC ". . . with the understanding that it [the data] would not be released to anyone else." They were told that they would be given production data if the companies agreed, but that it was very improbable that they would get permission to obtain reserve data. They then sought permission from the companies to obtain the production data which they received. In their desire to move on with the study, the judgment was made that it was not worthwhile to try to obtain reserve data. This judgment, we believe, has been supported by the FTC's experience in the collection of reserve data for natural gas.

We did state that:

". . . it seems anomalous to me that the Atomic Energy Commission, which is critically involved in the energy sector, and will probably be more critically involved in the future as uranium possibly increases its impact on the energy sector, that the Atomic Energy Commission apparently must get data from companies voluntarily. It does not have, apparently, the legal power to get data, which it would seem to me it is rather important to have for the Atomic Energy Commission, let alone for us in our attempt to understand what is happening in this industry and what is going on." [7]

I still find this situation anomalous, if not scandalous.

The above discussion explains the decision to proceed with the measurement of concentration on a production basis, for which there exists publicly available data. Unfortunately, these data are flawed so that our computed concentration ratios are not precise.[8] Each of the primary fuels will be discussed in turn.

Oil.—Concentration was measured in terms of production by barrels of oil. This measure ignores variations in the quality of the oil and excludes royalty oil.[9] An adjustment was made for the latter from previous estimates of the percentage of royalty oil to total production. This percentage was applied to all firms' production. The result for 1970:

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[3] The substitutability study did also, which constrained the analysis to the electric utility sector. This was partly because there did not exist ". . . relatively reliable data on fuel cost and use" for other sectors. *Ibid.*, p. 17.

[4] The FPC's National Gas Survey received a first year budgetary allocation of 22 people and some $340,000.

[5] Litton Industries, one of the respondents in the *Conglomerate Merger Performance Study*, did not lose its fight concerning compliance with the Bureau's 6(b) until September 1972, *three* years after the investigation began. And the 6(b)'s for this study *did not have to go through OMB* because less than 10 firms were involved.

[6] *Concentration by Competing Raw Fuel Industries in the Energy Market and Its Impact on Small Business*, 1971.

[7] *Ibid.*, p. 23.

[8] The production data could be improved by the use of 6(b) questionnaires. The the owner of land from which the oil is recovered.

[9] This is oil produced and controlled by the firm in question, but legally belonging to the owner of land from which the oil is recovered.

	Production	Adjusted for royalty, oil
4 firms	27.7	31.0
8 firms	43.0	49.1

Concentration has risen since 1955 when the respective figures were 18.6 percent and 30.4 percent. Although the levels are still relatively low,[10] some factors suggest that the rise of the last decade will continue "... because the major petroleum companies appear to be obtaining the majority of offshore and Alaska oil and gas leases."

Coal.—The chief difficulty with coal statistics is that coal varies with respect to quality. Therefore, company figures and the resultant national totals are combinations of nonhomogeneous commodities—the apples and oranges problem. Using these figures, the 1970 4- and 8-firm concentration ratios were 30.7 percent and 41.2 percent, respectively. If captive production is excluded,[11] the percentages are 36.0 and 47.6, respectively. Inclusion of the captive production makes economic sense since this supply can enter the open market if price and supply developments so warrant and since this production is not really distinguishable from production tied up in long-term contracts, which is included in the industry's statistics.

The trend in concentration is upward: the 4- and 8-firm concentration ratios in 1955 were 17.8 and 25.4, respectively. This rise appears to be the product of a variety of economic forces, most notably the economies of scale in strip mining, a method which is increasingly accounting for more and more of coal production. In terms of the adjusted figure, concentration has risen from 1955 when 4- and 8-firm concentration percentages were 21.2 and 35.9 respectively.

These concentration ratios, even with an upward trend, are at best moderate. However, concentration levels are not fully indicative of the state of competition because:

(1) Concentration is higher at other stages of the industry;

(2) The majors control pipeline flows;

(3) There exist many joint ventures, particularly in the bids for oil and gas leases, which are not reflected in concentration ratios;

(4) The Government has, through a variety of arrangements, helped cartelize the industry.

Natural Gas.—Concentration was measured from published company sources on marketed production for the U.S. and Canada combined (total gross amount of gas withdrawn from a reservoir minus the amount flared or returned to the reservoir). The data are not available on a consistent basis: some firms report gross production, others net (gross minus return to the reservoir and "shrinkage"); some report combined U.S. and Canadian production, otherse not; some exclude royalty productions, others not; some include natural gas liquids, others not. In some instances, then, we are adding together apples and oranges.

The result for 1970 is, nevertheless:

4-Firm	24.4%.
8-Firm	39.1%.

Uranium.—The statistics for this sector are those reported by the AEC, with the permission of the companies, or by the companies directly. They are based on the amount of uranium oxide (U_3O_8) recovered by the integrated mining and milling companies. In 1970, the 4 and 8 largest integrated milling companies produced 55.3 and 79.8 percent of U_3O_8, respectively.

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[10] John W. Wilson has testified that the top 4 firms accounted for 68.4 percent and the 8 firms 85.0 percent of estimated first year volumes (1972 contract dates) for new Long-Term Offshore sales of Natural Gas in Louisiana. See: Testimony of John W. Wilson, Office of Economics, Federal Power Commission, Exhibit 33 in Dockets C173–293, C173–335 and C173–336, March 1973.

Such concentration ratios are relevant only if the present total supply is committed in a way which precludes a buyer from bidding for it. It is our understanding that this is not the case. Since Wilson's concentration ratio is based on new contract sales in Offshore Louisiana of 201.8 billion cubic feet, his new contract figure amounts to only about 0.9 percent of total U.S. production for 1972. As a result, Wilson's computation tells us little about concentration in natural gas production. See: U.S. Department of the Interior, Bureau of Mines, "Natural Gas—Fourth Quarter 1972," prepared in Division of Fossil Fuels, Feb. 28, 1973.

[11] Captive production refers to production of coal by mines which are wholly owned subsidiaries of other companies (such as steel companies) and do not ordinarily sell any coal on the open market.

However, these companies are not fully integrated. There are some independent mines. In 1970, the top 15 milling companies mined 95.5 percent of the uranium ore. Applying this percentage to the above figures on U_3O_8 production, we obtain an estimate of the percentage of U_3O_8 mined by the top 4 and top 8 milling companies: 52.8 percent and 76.2 percent, respectively.

We have not computed a trend because the role of independent mines was much larger in the past. Since we cannot obtain their production directly, we can only report at best the amount produced by 4- and 8-largest milling companies, using the same kind of procedure as above. Such a figure probably understates concentration because some independent mines were larger than the captive mines of the milling firms. Therefore, we have no exact idea of the change in concentration over time.

Furthermore, it is only recently that uranium has entered as a competitive fuel to supply energy. In the past, the ore went into bombs or stockpiles. It is, therefore, unclear whether past concentration is comparable to present concentration because there were two very different industries in terms of end use.

Concentration at present is substantial and suggests that the degree of competition would not be intense. Furthermore, concentration is higher at upstream stages and joint ventures characterize the milling stage. Moreover, there are substantial barriers to entry to mining-milling, the combined operation an apparent necessity. The economies of scale are substantial; and the AEC has in a variety of ways, and will continue to do so, influenced the degree of concentration.

SUMMARY

Concentration levels appear to be relatively low in oil, natural gas, and coal, but rising markedly. In uranium, the level is substantial and has probably risen. The increased fuel intersubstitutability, however, acts as a deflationary force on concentration levels, unless the major firms are coming under common ownership. The extent to which such an exent is inhibiting declines in concentration is the subject of the last chapter.

Enclosure 3

Response to Senator Hart—Federal Trade Commission Investigations of Gasoline Markeeting Practices and the Competitive Situation in the Petroleum Industry

This report is in response to Senator Hart's letter of June 5, 1973, to Chairman Engman regarding the Federal Trade Commission's studies and investigations in the energy industry. Their report specifically relates to the Bureau of Competition's investigations of gasoline marketing practices and the competitive situation in the petroleum industry.

Investigations of Gasoline Marketing Practices

Pursuant to a letter from Senator Hart, complaints from gasoline marketers and the public, and other information concerning anti-competitive gasoline marketing practices, the Commission directed an investigation on December 22, 1970, into the marketing practices of the major oil companies.

I. INVESTIGATIONS

The Commission conducted preliminary investigations in Florida, Missouri, Ohio, Michigan, and Wisconsin and opened other investigations to some of the largest marketers of gasoline in January and February of 1972. The Commission opened formal investigations of the Standard Oil Company of Ohio in May, 1971 and a formal investigation of the Phillips Petroleum Company in April, 1971.

The Commission issued a complaint against the Standard Oil Company (and its subsidiaries Sohio) on January 18, 1973, charging that it had violated the provisions of the Federal Trade Commission Act. Sohio, in the course and conduct of its business, actively competes with other petroleum companies throughout the United States in the purchase for resale of petroleum products, tires, batteries and accessories. Sohio is also engaged in direct retail sales of petroleum products, tires, batteries and accessories, through the use of company operated retail outlets, in competition with its retail service station dealers with other petroleum companies and their dealers, and other retailers of such products in the various states of the United States.

The Commission's area of concern is Sohio's policy of granting to certain of its retail service station dealers temporary competitive allowances credited to the regular tankwagon price of its gasolines. The granting of such allowances generally occurs in market areas where there is a price disturbance usually in the nature of a local or area price war. The aforementioned policy was put into effect, maintained, and carried out on or about March, 1970 and at different times thereafter.

The Commission issued its complaint against Sohio on the grounds that Sohio, acting together and in combination with certain of its retail service station dealers, and as both a supplier and a competitor, agreed to fix and maintain, and did so fix and maintain, the retail price at which gasolines were sold or were to be sold at said retail service stations, and further agreed to, and adhered to, certain discounts, rebates, allowances, terms and conditions upon which the gasoline would be sold to retail service station dealers and to the purchasing public. The case is presently in the pre-trial stage and is being conducted by the Cleveland Regional Office. The Cleveland office has held extensive investigational hearings to take the testimony of gasoline service station operators and company executives and has subpoenaed documents from Sohio.

On May 15, 1973, the Commission issued a complaint against Phillips Petroleum Company. The complaint resulted from an investigation of Phillips concerning the use of lease coercion and limitations on products offered for resale. The Phillips investigation was conducted in order to determine whether or not Phillips was in violation of Section 5 of the Federal Trade Commission Act. Practices investigated included:

(1) dealer coercion under a short term lease;

(2) arbitrary lease cancellations;

(3) illegal tie-ins;

(4) market foreclosure to competitors;

(5) requirement of a minimum purchase amount;

(6) inspection and surveillance as a means of controlling business operations; and

(7) no equitable procedures for the resolution of legitimate dealer-company disputes.

The short term lease was the focal point of the investigation because it was the basis of the practices enumerated above. Phillips exercised control of lessee dealers through contractual agreements that restricted their retail marketing activities. It thereby curtailed competition. The Commission staff has been negotiating with Phillips and may settle this case if it can achieve the goals of the Commission without a prolonged and expensive trial.

In its investigations in Detroit, the Bureau of Competition has issued several subpoenas for documents to two major oil companies. The Bureau issued an extensive subpoena to one major oil company on April 12, 1972, and the company resisted compliance with the subpoena until so ordered by the Commission to submit the documents. The company still has not submitted all of the requested information. The Bureau staff has held hearings, taken the testimony of the executives of this company in Detroit and Washington, and has conducted extensive interviews of present and former gasoline service station dealers of this company.

The Bureau initiated an investigation of another major oil company in Milwaukee in February of 1972 regarding retail pricing policy. Said investigation has now been shifted to Detroit. In March and April of 1973, the staff subpoenaed documents and testimony from several executives of this corporation regarding their marketing practices in Detroit and other parts of the country. In total, the Bureau of Competition has received testimony, over a quarter of a million documents and other information in its investigation of these major marketers of gasoline. After analysis of this information, the staff would recommend appropriate action on these investigations.

III. INVESTIGATIVE TECHNIQUES

All of these gasoline marketing investigations have employed similar investigative techniques which include:

(1) collection of information from injured gasoline station owners;

(2) testimony of oil company executives;

(3) documents from major marketers of gasoline; and

(4) the employment of data processing technology to assist in the analysis of the voluminous documents subpoenaed—a new development.

The preliminary conclusion of the staff of the Bureau of Competition in these investigations is that a significant number of the major marketers of gasoline employ marketing techniques which tend to stabilize and support retail gasoline prices which may be higher than would exist if these companies abandoned these techniques. The Commission will continue to investigate marketing practices of major marketers to determine whether a particular company may be employing marketing techniques which tend to encourage high retail gasoline prices and which may violate Section 5 of the Federal Trade Commission Act.

Investigation of the Structure of the Petroleum Industry History of Investigation

The current investigation was authorized by the Commission late in 1971. Subpoenas to several major oil companies were issued early in 1972. They were drafted to obtain a limited number of documents concerning the companies' activities in production, transportation, refining and marketing of petroleum products. There were clear and immediate indications that the companies would resist the subpoenas and in light of previous experience with subpoena enforcement delay, they were withdrawn.

Methodology

Because of the resistance to the Commission's subpoenas, a new investigative strategy was employed. The staff of the Bureau of Competition sent detailed questionnaires to the larger independent crude producers, petroleum refiners and gasoline marketers in the United States. A follow-up search of their files and personal interviews were conducted. From August, 1972 until the first part of April, 1973, the staff contacted and obtained information from over thirty independent petroleum companies. In general, these independent companies voluntarily complied with the staffs' request for information and documents.

The staff obtained substantial information on the petroleum industry from published public and governmental sources. A wealth of relevant and reliable information on the structure of the industry is available from these sources. The staff collected further valuable information from the Department of Interior, the Oil Import Appeals Board, the Interstate Commerce Commission, and other federal agencies. Various state taxing authorities and several state agencies such as the Texas Railway Commission were contacted. These governmental agencies were cooperative in providing the requested information.

In April and May of 1973, with the assignment of additional lawyers, economists and para-legal personnel, the Commission staff analyzed the information it had received.

To supplement the staff's understanding of the structure and operation of the oil industry, the Federal Trade Commission once again issued subpoenas *ad testificandum* to corporate officials of the major oil companies. Rather than merely subpoena documents, the strategy was to develop the factual information through testimony of petroleum company executives, identify relevant documents and make on-the-record requests for submission of such documents to the Commission. These investigative hearings began May 21, 1973 and every effort is being made to expedite them in light of the gasoline supply situation.

Preliminary Finding About The Structure Of The Petroleum Industry

A. *Importance of the non-integrated sector*

The independent marketers of petroleum have played a vital role in keeping the petroleum markets competitive, flexible and dynamic. They have brought competition into an industry that is highly concentrated and have pioneered innovations in methods of petroleum distribution. The non-integrated sector has traditionally lead the way in translating increased efficiencies into lower consumer prices. They have exerted a beneficial influence upon oil industry competition that is disproportionate to their numbers.

Any substantial weakening of the independent sector of the oil industry would be disastrous for competition. In the long run, the result would probably be increased unresponsiveness to market conditions, a deterioration in product quality and service characteristic of non-competitive markets. Even in the short run, it is likely that consumer prices would rise sharply.

B. *Factors affecting viability of non-integrated sector*

1. *Independent marketers of petroleum have been unable to obtain a reliable supply of refined gasoline.*

a. *Concentration of the oil refinery industry.*—The independent marketers, in recent years, have obtained most of their gasoline from independent refining companies and small integrated oil producers. The latter have not had developed marketing techniques and as a result have sold their surplus gasoline to the independents.

The major oil companies, who are also this nation's major crude oil producers and importers, have increased their influence over the amount of crude oil available to independent refiners. The supply of crude oil was limited in the 1930's by state prorationing programs and in 1959 by a stringent mandatory import quotas. The independent refiners, thus, were limited in their ability to obtain supplies of crude from abroad or through increased domestic production. As a result, they came to depend upon the major oil companies for adequate supplies of crude oil.

In response to this increased dependence, the independent refiners patterned their market behavior after that of the integrated oil firms. They showed increased caution in dealing with independent marketers and in some cases exhibited great reluctance in selling refined product to marketers who were aggressive in setting prices.

The independent refiners, either formally or informally, have occasionally concluded processing agreements with the major oil companies. The agreements provide that an independent refiner will receive needed crude oil from a major company in exchange for a commitment to supply refined gasoline to the major company's retailers. The effect of these agreements is to restrict the availability of the independent refiner's gasoline to independent marketers.

Exchange agreements between major oil companies have the effect of excluding crude oil from independent refiners. Under these agreements the companies trade crude oil with one another irrespective of the needs of independent refiners.

Presently, the major companies dominate oil refining in the United States. In the eastern and gulf coast regions of the country where almost fifty percent of all gasoline is consumed, the eight largest integrated refineries have more than sixty-five percent of all refinery capacity.[1]

Beyond that, the control of refinery capacity and pipelines by the major oil companies has contributed to the present plight of the independent marketers and constitutes a major competitive problem in the oil industry.

b. Barrier to entry in the independent refinery market.—One would expect the increased demand for gasoline to attract new independent refineries, but there are severe limitations to entry in this market. First, the capital costs of building a minimally efficient refinery (approximately 100,000 barrels per day) are enormous. It is estimated that the cost of a new and efficient refinery would be $250,000,000.[2]

Second, it appears that a combination of high crude oil prices and low refined oil prices has kept margins which refiners can expect to earn at such a low level that new independent entry into refining has not been encouraged. Indeed, the oil depletion allowance creates an additional incentive for the major oil companies to keep crude prices high and maintain small refinery margins since a dollar of refinery profit will always be taxed at a higher rate than a dollar of crude oil profit.

Despite the fact that the demand for gasoline has almost doubled in the last 23 years, there has been virtually no new entry into the industry. In fact, in the eastern region of the United States, only one independent refinery with a capacity of 2,000 barrels per day has been constructed since 1950. No independent refinery with capacity in excess of 10,000 barrels per day has been built in the Gulf Coast Region (District 3) since 1950.

2. *Adverse Impact of Government Regulation*

Specific government regulations in the petroleum area, although aimed at significant long-term goals, have had some detrimental effects on competition. Prorationing was instituted to conserve and maintain orderly production of crude; it has, however, restricted supply. The depletion allowance has supposedly encouraged crude oil exploration: it has, however, tended to discourage new entry at the refining level. The crude oil import quota system was rationalized as necessary to protect the nation from dependency on foreign crude sources: it has however, curtailed supply sources for independent refiners and marketers and encouraged higher prices.

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[1] U.S. Department of Interior, Bureau of Mines, Mineral Industry Surveys Petroleum Refiners in the U.S. and Puerto Rico, Jan. 1, 1972, pp. 4–12.

[2] Wall Street Journal, Apr. 17, 1973, p. 15.

Preliminary Conclusions

The staff of the Bureau of Competition has preliminarily concluded that the structure, conduct and performance of the petroleum industry raises serious antitrust issues. The industry is highly concentrated at the refinery level and the barriers to entry at that level are overwhelming. Further analysis of the information obtained from the independent crude producers, petroleum refiners, gasoline marketers and major oil companies is necessary. By July 1, 1973, the staff of the Bureau of Competition will have made recommendations to the Commission as to appropriate means for resolving these issues.

Exhibit 2—Article From the Washington Post Concerning FTC Report on Oil Firms Probe

[From the Washington (D.C.) Post, June 6, 1973]

FTC REPORT NEAR—OIL FIRMS PROBED

(By Bailey Morris)

A year-long government probe of the role of the major oil companies in the current fuel shortages will be completed by July 1 under new orders issued by the chairman of the Federal Trade Commission.

The final date for completion of the report was disclosed in a letter to Congress at the same time agency spokesmen reported that the FTC has gone to court to extract key information from the major oil companies.

For more than one year, the FTC has been investigating the "structure, conduct and performance" of the oil industry as part of a three-pronged investigation of the causes of the energy crisis.

In a letter to Sen. Henry Jackson, D.-Wash., FTC Chairman Lewis A. Engman said the petroleum industry study is nearly complete and will be sent to him "no later than July 1."

Last Friday, Jackson and Sen. Hubert Humphrey, D. Minn., urged the FTC to find out whether a "contrived effort" by the oil companies is behind the dwindling supplies of fuel.

Engman told Jackson the information he seeks will be provided "as soon as possible" after completion of the oil probe which has been given top priority at the FTC.

Executives of all the major companies were subpoenaed for hearings in Washington which began May 21 and will run until the last week in June, an FTC spokesman said.

He said the FTC had met with stiff resistance from the oil companies before deciding to subpoena the executives directly.

In another development, the U.S. Attorney's Office filed suits against all but two of the major oil companies on Monday, ordering them totestify and produce documents in connection with the natural gas study.

Gulf Oil Co. were the only two firms which had complied with the original subpoenas for documents issued on behalf of the FTC in November 1971.

Nine other oil companies were ordered to show cause why they should not comply with the original subpoena in petitions filed in U.S. District Court here.

Sen. Jackson, in asking the FTC for information, said the major oil companies appear to be squeezing independent operators out of business at the same time they are forcing up the price of gasoline and other petroleum products.

Congressional concern over other reecnt developments in the $18-billion-a-year energy industry prompted the FTC to begin its massive investigation more than a year ago.

The FTC was asked to determine, among other things, whether oil companies which control large coal properties are stalling technological developments such as the conversion of coal to oil.

In addition, Congress asked the agency to find out what percentage of the entire energy industry is now controlled by the oil companies.

Mergers have brought some 20 percent of existing coal deposits under the control of the oil industry, congressional hearings revealed, and four of the largest oil companies are said to control 23 percent of domestic coal production, congressional aides said.

The FTC study started slowly with only a few staff people assigned to it. But after public alarm over diminishing energy supplies increased, the study was stepped up dramatically.

In recent weeks, FTC officials and former agency bureau heads have indicated that the commission staff has given serious consideration to what, if any, antitrust action should be taken against the major oil companies based on its findings.

Senator HART. As indicated, we will now hear from Mr. Halverson and Dr. Mann.

Gentlemen, you may proceed in whatever order you would like.

STATEMENT OF JAMES T. HALVERSON, DIRECTOR, BUREAU OF COMPETITION, FEDERAL TRADE COMMISSION

Mr. HALVERSON. Thank you, Mr. Chairman. I am James T. Halverson, and seated to my left is Dr. H. Michael Mann. I have a prepared statement which I would like to read into the record, and I will be very happy to answer any questions you may have.

Senator HART. All right.

Mr. HALVERSON. At the outset, Mr. Chairman, I would like to thank you for the opportunity to appear before this committee and discuss the Bureau of Competition's investigations of the energy industries.

Chairman Engman has provided you with a chronology of all Commission efforts with respect to its various investigations of the energy industries. I will discuss the facts developed by the Bureau of Competition to date, and our plans for further action.

I want to state at the outset that my remarks are wholly my own and do not constitute an official statement for the Federal Trade Commission or any Commissioner. The Commission has neither reviewed nor approved my testimony.

Because the Bureau has proceeded simultaneously on several fronts, my remarks will cover in turn: The investigation of natural gas reserve reporting practices, the investigation of gasoline marketing practices, and the competitive situation in the petroleum industry.

To date, the Bureau has experienced considerable difficulty in obtaining responses from most of the companies subpenaed in the natural gas investigation. The necessity of resorting to time-consuming subpena enforcement proceedings has resulted in significant delay. However, on the basis of documentation already in the Bureau's possession, it is apparent to us that:

1. Serious underreporting by the natural gas producers to the Federal Power Commission of natural gas reserves has existed and continues to exist;
2. The procedure of reporting reserves through a subcommittee of the American Gas Association composed of employees of major producers could provide the vehicle for a conspiracy among the companies involved to underreport gas reserves, but more information is needed in this area.

The American Gas Association, through its committee on natural gas reserves, is the only agency reporting proved reserves of natural gas for the entire United States. Ten subcommittees had been created by this committee to report proved reserves of natural gas for the various producing regions in the United States.

Because of the large potential reserves in the south Louisiana area and because there had been several allegations disputing the accuracy of the reported reserves for the south Louisiana area, it was decided to conduct a pilot investigation of the actual operation of the south Louisiana area subcommittee.

It was learned that each subcommittee member was assigned fields in which his employer was the major producer. This member would compile reserve estimates for the fields assigned to him. The only review of each member's estimates is by fellow subcommittee members. Even if this review is limited in the sense that subcommittee members only see the final estimate for a particular field and they do not see the underlying data. The subcommittee chairman aggregates these estimates into a regional total and then submits that total to the main committees.

The committee on natural gas reserves for the American Gas Association compiles the regional totals from each subcommittee and annually publishes the total proven natural gas reserves for the United States.

To verify the published AGA reserve figures, an attempt was made by the Bureau of Competition to secure certain reserve information pertaining to south Louisiana that was contained on form 15 reports filed with the Federal Power Commission. Form 15 reports are filed annually by interstate natural gas pipeline companies and reflect the remaining recoverable, salable gas reserves committed to, controlled by, or possessed by the reporting pipeline company.

Although we were not able to obtain this information from the FPC, the Bureau of Competition did obtain through other sources certain data from form 15 reports. A comparison between the AGA field-by-field figures and data from these form 15 reports, disclosed several instances in which companies have reported reserves on form 15's that are twice the quantities of reserves reported for such fields by the AGA.

This discovery, in turn, led the Bureau to draft a comprehensive subpena directed to the major producers. The theory of the investigation was to compare the reserve estimates used by the companies for internal purposes, with the estimates submitted to the American Gas Association that were relied on by the Federal Power Commission in substantially increasing the rate for south Louisiana, based on an alleged shortage of gas supply.

The investigation was not attempting to make new estimates of the proved reserves in south Louisiana but was instead attempting to obtain reserve estimates already prepared. It was our experience that raw data necessary to make original estimates of natural gas reserves cannot be obtained outside of company sources and that when the Federal Power Commission relies solely on the company to provide all the raw data, without independent audit, that reliance is misplaced.

Furthermore, comparison between company documents containing estimates which the staff has obtained and the AGA estimates from the year 1962 to 1970 have already revealed that although there has always been a discrepancy between the figures, this discrepancy significantly increased in 1968 and 1969, the crucial years in our study because of the reliance by the FPC upon 1969 AGA data in their area rate case for south Louisiana.

The documents received from the companies which have partially responded to the subpenas do not, of course, provide a complete picture of the reserve reporting procedures of the American Gas Association. A complete assessment is difficult to make until all the responses have been received from the other companies subpenaed.

However, several preliminary indications applicable to the south Louisiana offshore area have become apparent.

It was found that proved reserves is a term used industrywide and that the definition for proved reserves utilized by the AGA is also the definition employed by companies. Estimates of proved reserves are used for many purposes. However, the estimates of proved reserves for a given lease that are reflected in in-house annual reports (that is, annual reports kept inside the company which were primarily used for tax purposes) have been found to be lower than estimates of proved reserves that are used for other in-house purposes such as decisions whether to build a drilling platform on a tract or to sell reserves to a pipeline company.

Sometimes the difference is very significant—amounting to over 200 percent. Both because of this trend, and because of the tax-related purpose of the in-house compilation of reserves, it has been surmised that at the very least the in-house corporate compilations of proved or book reserves are conservative.

Notwithstanding the conservative nature of these estimates, comparison between these in-house compilations of lease-by-lease estimates of proved reserves with estimates of the South Louisiana Subcommittee of the American Gas Association has revealed very significant discrepancies between the estimates.

The estimates of proved reserves submitted to the South Louisiana Subcommittee of the AGA have been found to be significantly lower than the estimates of proved reserves reflected in the corporate compilations. Some of the estimates are approximately equal, but no corporate estimate has been found to date that is lower than the estimate submitted to the subcommittee.

I would like to supplement my prepared statement and add something here. At times the estimate for a given field as reflected by company documents is as much as 10 times the estimate submitted for that same field at the same time to the American Gas Association. The Bureau's investigation has uncovered numerous instances in which apparently substantial amounts of proved reserves of natural gas have been discovered in the Federal offshore areas and not produced.

By that I mean that they have actually been found to exist by drilling a well but the tract has not been produced. These are proved, as we understand the meaning of the word "proved," but are not reported or are only nominally reported.

Tracts in the offshore area, usually nominated by producers, are offered for lease to the highest bid by the U.S. Geological Survey. If a company finds hydrocarbons and places these on production within a 5-year period, it pays 12½-percent royalty on the amount produced and holds the lease indefinitely as long as production continues.

However, under current regulations there are ways to extend the 5-year term without going into production. A company within the

5-year primary term can select one of the wells drilled and have a production test witnessed by the USGS. If they determine this well is capable of producing in paying quantities, they may grant a 1-year suspension on production.

One company's submission indicates that 14 of their leases in the offshore area have been granted a suspension of production. Some of these suspensions of production have extended the term of the lease 5 years beyond the primary term. One of the reasons given by the producers to the USGS for the suspensions of production is that the companies have spent a fortune for the lease and should not forfeit the lease. In summary, they are not in production, but have been discovered, and are only nominally or not at all reported.

Complete responses from all the companies subpenaed would provide a more accurate assessment of the reserve reporting procedure of the American Gas Association. From the documents received and the investigation to date, it appears that there has been serious underreporting of proved natural gas reserves. Although no conclusive evidence has been found as yet of an actual conspiracy to under report reserves, the investigation has revealed that the procedure for reporting reserves through a subcommittee composed of employees of major producers might provide the vehicle for such a conspiracy.

Pending enforcement of the Commission's subpenas by the Department of Justice, the staff is reviewing approximately 36,000 documents produced by one company in partial compliance with the subpena. A return hearing is set for July 31 and August 1, at which time company officials will be questioned regarding the documents produced.

Hopefully, the remaining subpenaed documents will be obtained from all the companies involved as a result of the court enforcement proceeding. After reviewing this evidence, the Bureau of Competition will then be able to assess whether there is reason to believe the companies have violated the law and to recommend to the Commission whether complaints should be issued against them.

The Commission opened formal investigations of the Standard Oil Co. of Ohio in May 1971, and a formal investigation of the Phillips Petroleum Co. in April 1971. The Commission issued a complaint against the Standard Oil Co. and its subsidiary, Sohio, on January 18, 1973, charging that it had violated the provisions of the Federal Trade Commission Act.

The Commission's area of concern in Sohio's policy of granting to certain of its retail service station dealers temporary competitive allowances credited to the regular tankwagon price of its gasolines. The granting of such allowances generally occurs in market areas where there is a price disturbance usually in the nature of a local or area price war.

The Commission's complaint charges the Sohio, acting in combination with certain of its retail service station dealers, agreed to fix and maintain the retail price of gasoline. The case is presently in the pretrial stage and is being conducted by the Cleveland Regional Office in consultation with my office.

On May 14, 1973, the Commission issued a complaint against Phillips Petroleum Co. The complaint resulted from an investigation of Phillips concerning the use of lease coercion and limitations on products offered for resale. Practices investigated include:

1. Dealer coercion under a short term lease;
2. Arbitrary lease cancellations;
3. Illegal tie-ins;
4. Market foreclosures to competitors;
5. Requirement of a minimum purchase amount;
6. Inspection and surveillance as a means of controlling business operations; and
7. No equitable procedures for the resolution of legitimate dealer-company disputes.

The short-term lease was the focal point of the investigation because it was the basis of the practices enumerated above. Phillips exercised control of lessee dealers through contractual agreements that restricted their retail marketing activities.

I might add at this point that we have under investigation two other companies in the Detroit and Milwaukee areas for the use of arbitrary zoning for competitive allowances to force retail price maintenance at the lower level. We have had several thousand documents produced in the course of these investigations and recommendations may result from those.

Since late 1971, the Commission's staff has been conducting a broad-scale investigation of the structure and the competitive problems of the petroleum industry including investigational hearings at which top officials of major oil companies were required to testify under oath.

While this investigation is not quite complete, we can identify some of the sources of competitive problems and some reasons why the burden of the present gasoline shortage is falling with disproportionate severity on the independent sector, that is refiners, wholesalers, jobbers, and retailers who are not vertically integrated into the major oil companies.

Based upon the facts developed in this investigation to date, the staff has arrived at several preliminary conclusions. Our investigation suggests that activities by the major integrated petroleum companies have had significant anticompetitive effects. Their control of refinery capacity and pipelines also constitutes a significant competitive problem in the oil industry and contributes to the independents' present difficulty.

Independent marketers of petroleum have played a vital role in keeping petroleum markets competitive, flexible, and dynamic. They have brought price competition into an industry that is highly concentrated and have pioneered innovations in methods of petroleum distribution and marketing.

The nonintegrated sector has traditionally led the way in translating increased efficiencies into lower consumer prices. They have exerted a beneficial influence upon oil industry competition that is disproportionate to their numbers.

Any substantial weakening of the independent sector of the oil industry would be disastrous for competition. In the long run, the result would probably be increased unresponsiveness to market conditions and a deterioration in products, quality, and service.

Since early this year, the Bureau of Competition staff has been receiving, with increasing frequency, reports of independent marketers who have been forced to close some or even all of their stations. We are concerned that unless something is done quickly, irreparable harm may result.

As is clear from the present shortage, the major problem of the independent marketer is his inability to develop reliable sources of refined gasoline. A preliminary analysis of a survey conducted during our investigation indicates that independent gasoline marketers receive only about 2 percent of their supply from the eight largest integrated oil companies. Consequently, the independent marketers in recent years have been forced to rely on the smaller integrated companies and the independent refineries.

Even those sources of supply for the independent marketer are not outside the influence of the majors. The major integrated oil companies are the country's major sources of crude oil, both as producers and as importers, and they have increased their influence over the amount of crude oil available to independent refiners. As such, they are essential to the smaller integrated firms and even more so to independent refiners. State prorationing programs, now modified to allow 100-percent well operation, and, until recently, mandatory import quotas, also have limited the ability of the independent refiner to obtain supplies of crude. Given these facts, it is not surprising that some independent refiners have adopted the behavior patterns of the majors so as not to jeopardize their crude supplies. In particular, they have been reluctant to deal with independent marketers, particularly independent marketers who are aggressive competitors.

Any shortage, of course, makes this condition worse. In addition, processing arrangements between major and independent refineries have limited the amount of gasoline available to independent marketers. Under these processing agreements, a major supplies or consigns crude to the refiner in exchange for refined gasoline. The effect of these agreements is to restrict the availability of gasoline produced to the independent marketers.

The exchange agreement is another device used by the majors which has the effect of limiting the amount of crude oil available to independent refineries. Although arguments can be made for exchange agreement on the basis of efficiency in allocation of crude within this country, by these agreements crude is often kept off the open market where it might be bought by the highest bidder and is instead exchanged by a major with another major which has crude of its own although perhaps not geographically close by.

Again, the supply of crude for the nonintegrated refiner is restricted to the extent that his participation in these exchanges is limited during the period of shortage.

Another source of major concern is the fact that the demand for independent marketers for refined product has attracted only very limited independent refining capacity into the market. The reasons for this are several. First, the capital cost of building a minimally efficient refinery, approximately 100,000 barrels per day, is enormous. A major oil company has recently estimated that the cost of a new and efficient refinery would be $250 million.

Second, it appears that a combination of high crude oil prices and low prices of refined products has kept margins which refiners can expect to earn at such a low level that new independent entry into this refining has not been encouraged. Indeed, the oil depletion allowance creats for the majors an additional incentive to keep crude prices high and maintain small refinery margins, since a dollar of refinery profit will always be taxed at a higher rates than a dollar of crude oil profit.

Presently, the major integrated oil companies dominate oil refining in the United States. The situation in the eastern and gulf coast regions of the United States, PAD districts 1 and 3, where almost 50 percent of all gasoline is consumed, is such that the eight largest integrated refiners have more than 65 percent of the refinery capacity.

Since 1950, despite the fact that the demand for gasoline has almost doubled, there has been virtually no new entry into the industry. As a result, concentration has remained practically unchanged.

This, of course, runs contrary to expectations. Rapid growth in an industry is usually accompanied by rising profits which attract new firms. This process should reduce concentration and the market power of the leading firms. In the eastern region, district 1, however, only insubstantial independent refinery capacity has been built since 1950; one such refinery was a small 2,000-barrel-a-day refinery in Florida. I might add that that refinery is now being used for asphalt refining and not for gasoline refining. No independent refinery with capacity in excess of 10,000 barrels per day has been built in the gulf coast region, district 3, since 1950.

We have good reason to suspect that the available statistics understate the majors' dominance over refining. First, it is usually true that major oil companies operate nearer 100 percent of capacity than do independent refiners, so that if concentration could be measured in terms of actual production rather than capacity, the share of the majors in districts 1 and 3 would probably be greater than 65 percent.

Second, at least some of the production of independent refiners is controlled by the majors through direct and indirect processing agreements so that their market position is enhanced by this factor as well.

I have explained the operation of the agreements by which crude is supplied to the independent refinery. So, if you include those figures that would increase the control of refined products by the majors in districts 1 and 3, even when crude was in relative abundance, the independent marketer was limited in the share of the market he could obtain because of the limited number of independent refiners available to supply him refined products. Thus, since the development of the present crude shortage, the problem of the independent has become one of survival.

On the basis of these facts, developed during the course of this investigation of the structure of the petroleum industry, the staff of the Bureau of Competition has preliminarily concluded that the structure, conduct, and performance of the petroleum industry raises serious antitrust issues. The industry is highly concentrated at the refinery level, and the barriers to entry at that level are overwhelming.

Furthermore, the effect of the industry structure and conduct in combination with the recent oil shortage has been to stabilize and support high retail gasoline prices. Further analysis of the information obtained from the independent crude producers, petroleum refiners, gasoline marketers and major oil companies is continuing. By July 1, 1973, the staff of the Bureau of Competition expects to have formulated recommendations to the Commission as to appropriate means for resolving these issues.

This concludes my prepared remarks. I will try to answer any questions any of the members of the Committee may have regarding our investigation of the energy industries.

Thank you.

Senator HART. Thank you.

There are questions, but as I understand your testimony, what you are telling us is that the gas reserve information which the FPC has obtained is basically worthless for determining whether there is a natural gas shortage. Have I arrived at a fair conclusion?

Mr. HALVERSON. On the basis of the information which we have completely reviewed as of this date, it appears to us there has been a substantial under-reporting of gas reserves when we compare in-house data with the data compiled by the AGA.

Senator HART. When we talk about increased price to the consumer, is the data which you are suggesting is inadequate an essential and critical element in the prognosis of what kind of price you have?

Mr. HALVERSON. That is the way I understand it, Mr. Chairman.

Senator HART. As I understand the reserve study, according to Dr. Paul Root, who is technical director of the gas study, there was a 100-percent sampling of the 108 fields. Those were the large established fields. There was a less than 1-percent sampling of the other 50 fields and there were discrepancies up to 800 percent in reports received from those 50 fields.

Now, is or is not this type of field sampling valid to determine independently what natural gas reserves are?

Mr. HALVERSON. I am not sure which study you are talking about.

Senator HART. I am talking about the natural gas reserve study which is the Power Commission's undertaking.

Mr. HALVERSON. I believe I can answer that. To the extent that the selection process is made so that the most mature fields, which are the oldest and the most depleted and have the most experience, are chosen—which we think has happened in the FPC study of south Louisiana—you will have the estimates based on those fields where the reporting of information has been the most accurate. With respect to the other fields, where the experience has been least, the reporting of information tends to be less accurate; hence, basing estimates on the fields where you have the most experience and where most of the production has already taken place could be misleading.

Senator HART. To check the AGA figures you would have to check the 50 fields, wouldn't you?

Mr. CHUMBRIS. Mr. Chairman, before you leave this point, may I interject?

Dr. Root says that there may be a miscalculation as high as 800 percent. That in itself is tremendously misleading. That might be just one instance out of I don't know how many samplings. We have been arguing for 3 years about the fact that there is an 800-percent difference between the $1 billion cost of oil import programs and John Baline's $2 million.

We give credence to the $7.2 billion during the course of our hearings. In one instance, we give credence to the 800-percent discrepancy, but now we take issue that this 800-percent discrepancy may be one out of I don't know how many samples.

We have to come to some kind of conclusion: Is there an energy shortage or is there not? How much reserves do we have, or how much reserve do we not have? Frankly, from reading your statement, if you went across the board and made a study of each one, you may find out that the inconsistency is the other way.

Mr. HALVERSON. I am saying that on the basis of our study of natural gas reserves reporting, we are concerned that there is consistent underreporting by the AGA to the FPC.

Mr. CHUMBRIS. You don't know how much underreporting there is, do you?

Mr. HALVERSON. It depends on which field you are talking about. It has never been overreported on the data we have so far—that is, comparing in-house data with data submitted by AGA.

Mr. CHUMBRIS. It does not clarify anything as far as the record is concerned.

Senator HART. What he is saying is that he never discovered any overreporting.

Mr. HALVERSON. Yes.

Mr. CHUMBRIS. Where are you getting your data from?

Mr. HALVERSON. We are getting it from submissions by three companies, one of which we have not yet completely reviewed. It is in-house data. In south Louisiana, we had 11 subpenas. The rest of the companies have not complied with our subpenas.

Mr. CHUMBRIS. Somewhere along the line somebody is going to have to supply some statistics to convince Congress or the FPC, which has the administrative responsibility to change its course of action as to whether we should regulate or deregulate, or whether if we are going to regulate you are going to increase the price or whether you are going——

Senator HART. It is 20 minutes after 11 and we are in the process of getting the data.

Mr. CHUMBRIS. Mr. Chairman, you look at it one way and I look at it another way.

Senator HART. I can hear it only one way—the way the witness told us. He told us it ranges from what percentages?

Mr. HALVERSON. As high as 10 to 1.

Senator HART. All you are doing is underscoring the dramatic consistency of underreported reserves.

Mr. CHUMBRIS. Mr. Chairman, I am not impressed with whether we are underscoring the inconsistency. I am interested in what the record is going to show and let the chips fall where they may.

Senator HART. Let us get on with getting the chips.

One other point bears on your statement regarding the structure of the petroleum industry. It shows that your staff feels that the structure is anticompetitive. and you are going to make a recommendation to the Commission on July 1. That is Monday. Are you in a position to confirm what I read in the paper today? More specifically, can you give us a preview of your recommendations?

Mr. HALVERSON. Mr. Chairman, that recommendation is now obviously in draft form.

I think my statement gave you a pretty good summary of what problems we have identified. I would prefer not to describe the specific recommendations we are going to make, because I feel that may make it more difficult for the Commissioners to take an objective and independent look at this. I feel they should have an opportunity to review the recommendations and I would rather withhold more specific comment.

Senator HART. I don't want to ask a single question that might disturb what appears to be the course of events.

Mr. HALVERSON. I don't know where that headline came from. It didn't come from me.

Senator HART. I know it didn't. It didn't come from us.

Mr. Bangert.

Mr. BANGERT. I have one question I would like to ask Mr. Halverson. Yesterday, the FPC was in and they advised us they felt they have been extremely cooperative with the FTC on the AGA reporting investigation. I gather from your statement that the Commission has attempted to get information from the Power Commission and has apparently been denied this information. I think that the record should fully reflect the kind of cooperation which was received.

Specifically, it is our understanding that FTC wanted field-by-field reserve estimates collected in the natural gas study. The Federal Trade Commission wanted information which the Power Commission had on pipeline firms and they were told it would cost them $25,000 to get that. As I understand it, did you then go and get that same information from another source presumably at a bargain price?

FTC was refused access to FPC staff unless General Counsel or representatives of General Counsel's Office were there. I am wondering in general what kind of cooperation you received from the Power Commission in this investigation.

Mr. HALVERSON. First, let's discuss the form 15 request of 1971. Mr. Gooch, who I believe was General Counsel at that time, gave us an estimate that it would cost them $25,000 to supply us with the data we had requested.

I was not with the Commission at that time, but I understand that the staff didn't feel at that point in the investigation that it could authorize a $25,000 expenditure. Therefore, that avenue of inquiry was killed and they had to go somewhere else to try to get that kind of data.

Mr. BANGERT. Do you have any idea whether you spent more than $25,000 in staff time trying to get that kind of data from other sources?

Mr. HALVERSON. As a matter of fact, the form 15 data was only one part of all of the data we wanted to get from the companies. When we decided to go with the broad subpena, we decided to abandon that request which would have cost us $25,000, according to the FPC. Our subpenas will pick up all of that data anyway.

Mr. BANGERT. How about the field-by-field reserve estimates?

Mr. HALVERSON. We made that request on June 5, 1973, and we have had no response to it to date.

Mr. BANGERT. Yesterday, both Chairman Hart and Senator Kennedy indicated to Chairman Nassikas they would like a copy of the replies to your letter, so presumably we will be getting it some time soon. Did the fact that the FTC staff couldn't talk to FPC staff unless General Counsel or a representative was present inhibit your investigation in any way?

Mr. HALVERSON. Evidently that is FPC policy. It was the policy they stated to us.

Mr. BANGERT. Did your investigators feel that inhibited them?

Mr. HALVERSON. I am told that they feel having General Counsel's staff present does have some inhibiting effect.

Mr. BANGERT. Could this have caused their original opposition to this investigation?

Mr. HALVERSON. I didn't know that they opposed this investigation.

Mr. BANGERT. If you could make a general statement, just what kind of cooperation was received and what kind of communications were sent back and forth between the FTC and FPC?

Mr. HALVERSON. If you would like—and I think this may be better done by a written response supplementing the record—we will determine what oral communications took place and relate them to you in writing.

Mr. BANGERT. Thank you very much. I have no further questions.

[For the information requested above, see exhibits 1 and 6 at the end of Mr. Halverson's testimony.]

Senator HART. Mr. Chumbris.

Mr. CHUMBRIS. Thank you, Mr. Chairman.

I won't get involved in this fight between you and the Power Commission. I have enough problems with my own fights.

Sometimes, in carrying out the duties of this subcommittee, I will call the FTC or some other agency and they tell me that they can help us. At other times they tell me they are sorry, but we have to go through channels. This means I have to commit it to the chairman, and you get the letter, and submit it to your chairman, and he decides whether or not we can have the information.

Mr. Halverson, my bosses over the years have been very touchy about statistics and trying to keep them as accurate as possible. When we start talking about 2 to 1 or 3 to 1, you run into fantastic figures. We have had hearings where cost matters or pricing matters were blown out of proportion. I seem to be touchy on the subject, but it has been my responsibility for 17 years, and even though there is a little deriding laughter in the audience, it doesn't deter me one bit from asking those questions.

Mr. HALVERSON. Surely.

[The following was received for the record. Testimony resumes on p. 275.]

MATERIAL RELATING TO THE TESTIMONY OF JAMES T. HALVERSON

Exhibit 1.—Correspondence Relating to FTC's Attempt to Get Information from FPC on Natural Gas Reserves

FEDERAL TRADE COMMISSION INTERVIEW REPORT

Name and official position: Thomas H. Jenkins, Director, National Gas Survey; William Webb, Director Office of Public Information; Willard Savoy, Assistant Director Office of Public Inf.

Firm name and address: Dr. Paul J. Root, Technical Director, National Gas Survey, Federal Power Commission.

Place of interview: Washington, D.C., April 6, 1973.

On Friday, April 6, 1972, I called Thomas H. Jenkins, Director of the Federal Power Commission's National Gas Survey. I identified myself and the fact that I was working on a Federal Trade Commission investigation into the reserves' reporting by 11 oil companies and the American Gas Association. I explained to Mr. Jenkins that although we had some information on the National Gas Survey, we desired to update this information. He had told me that most of the material I would probably need was available in the Federal Power Commission's Office of Public Information. He referred me to Mr. William Webb, Director of Public Information. I then asked Mr. Jenkins if a date had been set for the release of the survey. Mr. Jenkins said that no date was set but it would certainly not be complete until at least some time in late summer. He also stated that no parts of the National Gas Survey would be released prior to the release of the entire report. I thanked him for the information and told him I would go to the Federal Power Commission's Office of Public Information.

I went to the Office of Public Information and asked for the public files relating to the National Gas Survey. These files purportedly include all releases and Federal Power Commission Orders dealing with the National Gas Survey. In addition these files include minutes of the various meetings of the various forces conducting the survey.

Briefly, a Federal Power Commission Order of February 23, 1971 provides for the establishment of three Advisory Committees. (Attachment A) An Order of April 6, 1971 establishes *inter alia*, a "Technical Advisory Committee—Supply." (Attachment B) The head of this Committee who is called a vice chairman is Myron A. Wright, Chairman of the Board, Humble Oil and Refining Company (now Exxon USA). The Federal Power Commission representative on the Committee is Dr. Paul J. Root, who is also the Technical Director of the National Gas Survey. By Order of December 21, 1971 the Federal Power Commission established *inter alia, a* "Supply—Technical Advisory Task Force—Natural Gas Supply" which would work in connection with the "Technical Advisory Committee—Supply." (Attachment C) The Task Force Director is Mr. Ralph W. Garrett; Exploration Analysis Manager, Humble Oil and Refining Company (now Exxon—USS). Its Deputy Director is Worthy Warnack who is a geologist with Humble Oil and Refining Company (now Exxon—USA).

In addition to the December 21, 1971 Order establishing a task force on Natural Gas Supply, the Commission also issued an "Order directing study and analysis of Natural Gas Reserves and prescribing procedures for the Natural Gas Survey." This Order was also issued on December 21, 1971. (Attachment D) In Appendix A of this Order, the Commission outlined the procedures to be followed in arriving at an "independent estimation of proved recoverable reserves of natural gas of the United States (p. 1 of Appendix A) The definition of proved reserves conforms exactly to the definition used by the American Gas Association. On Page 3 of Appendix A, Roman Numeral II sets out some security considerations. The first sentence is pertinent here. "Individual companies must, for competitive reasons, protect highly confidential information in competitive areas such as Offshore Louisiana." One of the means arrived at to protect this information is set out in II, A which states that no worksheets will leave the producer's offices. The final product of this National Gas Survey as indicated on page 9 of Appendix A would be the estimation of Gas Reserves in the United States as of December 31, 1970.

In the third paragraph of the first page of the second Order of December 21, 1971 (Attachment D), the Commission states that procedures for conducting this survey were recommended by the Task Force on Natural Gas Supply at its December 14, 1971 meeting. Through further research I have found that appended to the minutes of an October 21, 1971 meeting of the Survey's Executive Advisory Committee is a summary of the Task Force on Supply's apparent first meeting which was held on September 15, 1971. The December 14, 1971 meeting of the Task Force on Natural Gas Supply referred to in the Federal Power Commission's Order of December 21, 1971, appears to be the sixth meeting of this Task Force on Supply. The first sentence of the third paragraph on Page One of this Order says, "A report presenting a preliminary draft for procedures concerning a survey and analysis of natural gas reserves was received by the National Gas Survey Coordinating Committee on October 12, 1971, and by the National Gas Survey Executive Advisory Committee on October 21, 1971." The Task Force on Natural Gas Supply had prepared the procedures and outline of the survey and had presented them first to the National Gas Survey Coordinating Committee and then to the National Gas Survey Executive Advisory Committee. The task Force on Natural Gas Supply then formally recommended these procedures in their December 14, 1971 meeting. The Commission's Order states, that, "Those procedures, as reviewed and modified by the Commission, are attached as Appendix A." At any rate, although the Commission established the task force on December 21, 1971, it had been meeting from

September 15, 1971. There is no public record of these meetings except for the brief summary contained in the minutes of the National Gas Survey Executive Advisory Committee meeting on October 21, 1971. There are in fact no minutes of the December 14, 1971 meeting which is referred to in the Commission's Order. So it is impossible to find out the degree to which the proposals of the Task Force were actually modified by the Commission.

After the procedures for the survey were recommended, a number of other representatives have been nominated to the Task Force Committee.

I looked through all the releases pertaining to the survey and I found references to July 29, 1971; February 17, 1972; April 11, 1972; May 25, 1972; July 12, 1972; January 16, 1973; February 26, 1973; Marsh 1, 1973; and March 28, 1973 meetings of the Task Force on Natural Gas Supply. Certain minutes of these meetings are missing.

I was able to find the January 16, 1973 minutes, the July 12, 1972 minutes and the April 11, 1972 minutes. The January 16, 1973 minutes are attached[1] and the comments of Dr. Paul J. Root on Page 3 of these minutes are of particular importance. Dr. Root, the Technical Director of the National Gas Survey, serves as the Federal Power Commission's Coordinating representative and secretary on the "Supply—Technical Advisory Task Force—Natural Gas Supply." Dr. Root indicated, "that no forecasts were received covering regions 1N and North Alaska and regions 2A, 6A, and 11A, the Offshore regions all of which are generally considered to be the key to domestic supply capabilities. Only in regions 3, 4, 5, 6, 7 and 11 were the responses adequate in order for standard statistical techniques to be used for averaging the projections. Dr. Root stated that this coupled with the lack of information for the Offshore regions represent a considerable deviation from the proposed program and makes a re-assessment of the Task Force plans a matter of urgency." In July 12, 1972 minutes there is a reference made to the fact that the worksheets worked up by Task Force members indicating reserve estimates might have to be submitted to the Federal Power Commission. This would represent a deviation from the procedure set out in the December 21, 1971 Appendix A wherein it stated that worksheets were to remain in the prducer's offices and were to be destroyed after the estimates were made. The minutes of the July 12, 1972 meeting state that several members of the Task Force objected to the request for papers to be delivered to the Federal Power Commission. These members stated that if they were required to submit their material to the Federal Power Commission they would only use Public Information to make the estimates.

Because some of these minutes were missing and because minutes for the three latest meetings were not as yet included in the public file, I asked the Assistant Director of the Office of Public Information, a Mr. Willard Savoy whether he had any further minutes of this Task Force's meetings. The Assistant Director suggested that I go up to Dr. Paul Root's office because Mr. Savoy felt certain that Dr. Root would have additional copies of these minutes. Both the Assistant Director and the Director of the Office of Public Information did not know when the survey was to be completed. Mr. Savoy, in fact, told me to tell him if I found out. At any rate the best estimate they were able to give me was late summer.

I called on Dr. Paul J. Root, Technical Director of the Natural Gas Survey. I identified myself and the nature of my assignment and the fact that I was referred to him by the Office of Public Information. Dr. Root stated that he would have to call the General Counsel's Office before he could talk to me. Mr. Edward Minor of the Federal Power Commission's Office of General Counsel agreed to come to Dr. Root's office. Dr. Root did state in the meantime, that he did not expect the survey to be published until late summer and that no part of the survey would be released separately.

When Mr. Minor arrived, I explained that I wanted a complete set of minutes for the meetings of the Task Force on Supply. I told them that several minutes were missing in the Office of Public Information and that it would greatly expedite my investigation if they could provide me copies. In addition, I told them that I had a few general questions regarding the procedures of the survey and one specific inquiry which was to ascertain the names of the fields in Offshore South Louisiana that were audited and estimated by the survey. Mr. Minor responded that if I would put my requests in writing they would study the request and possibly honor it subject to the limitation that the Office of Public Information would have to be searched first for this material.

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[1] Attachment E.

I thanked them for their indication of future cooperation and went back to the Office of Public Information. Copies of all the minutes of the Task Force that the Office of Public Information has are now being made and should be received shortly along with copies of certain recent orders pertaining to the survey.

Respectfully submitted,

THEODORE L. LYTLE, Jr.,
Attorney, Bureau of Competition.

MEMORANDUM

APRIL 19, 1973.

To: File.
From: Theodore L. Lytle, Jr., Bureau of Competition.
Subject: Supplementary to Interview Report of April 6, 1973.

On April 17, 1973 the undersigned sent a letter to Mr. Edward Minor which is attached. On May 7, 1973 Mr. Minor telephoned the writer and stated that part of the survey was going to be issued prior to June 1, 1973. I informed him that this was the first time that the FPC had informed me that the survey was going to be issued in separate parts. Mr. Minor then stated that because part of the survey was to be issued soon, he did not wish to anticipate the survey by providing me with the names of the Offshore South Louisiana Fields that were actually surveyed. In response to my question, he indicated that a list of the fields surveyed would be included in the soon to be issued report.

In regards to my first question which sought a list of the meetings of the Supply—Technical Advisory Task Force—National Gas Supply, Mr. Minor stated that meetings of this Task Force were held on February 17, 1972, May 25, 1972, July 12, 1972, January 16, 1973, March 1, 1973, and March 28, 1973. I then asked Mr. Minor whether there were any other meetings of the Task Force prior to February 17, 1972. He stated that to his knowledge there were no formal meetings prior to this time. I then mentioned the various references in the Public Record to meetings of this Task Force. He then stated that because the FPC was moving into new headquarters, records prior to 1972 were packed into cartons and presently unavailable to him. I then requested that a list of the meetings, formal or otherwise, be supplied to me as soon as the cartons were unpacked.

Respectfully submitted,

THEODORE L. LYTLE, *Attorney.*

APRIL 17, 1973.

EDWARD A. MINOR, Esq.,
Office of General Counsel,
Federal Power Commission,
Washington, D.C.

DEAR MR. MINOR: Subsequent to our meeting on April 6, 1973, I was able to obtain certain information regarding the National Gas Survey from the Office of Public Information of the Federal Power Commission. In addition to this information, I would appreciate receiving the following information not available at that office: (1) a list of all the meetings of the Supply—Technical Advisory Task Force—Natural Gas Supply and (2) a list of the fields in Offshore South Louisiana that were selected to be surveyed.

As I explained to you and Dr. Root on April 6, this information is requested in connection with a Federal Trade Commission investigation styled In the Matter of The American Gas Association, File No. 711 0042. Your cooperation in this matter will be appreciated.

Sincerely yours,

THEODORE L. LYTLE, Jr.,
Attorney, Bureau of Competition.

EDWARD A. MINOR, Esq.,
Office of General Counsel,
Federal Power Commission,
Washington, D.C.

DEAR MR. MINOR: The recently released Federal Power Commission's National Gas Reserves Study lists the major Offshore and smaller Offshore fields surveyed. Twenty of the 22 major Offshore fields listed and four out of five of the smaller fields listed are fields located in Offshore South Louisiana. As you know, the Federal Trade Commission's Investigationd styled *In the Matter of the American Gas Association,* File No. 721 0042 *inter alia* is attempting to compare Offshore South Louisiana field-by-field estimates submitted to the A.G.A. With Offshore Louisiana field-by-field estimates used by the various companies for internal purposes. In this connection, the A.G.A. field-by-field estimates for Offshore Louisiana have been obtained as have certain company documents. The Federal Power Commission's estimates for the 24 South Louisiana Offshore fields selected for their survey are needed to provide another means of verification and cross reference. In our interest to be as thorough as possible the Federal Power Commission's reserve estimates for those Offshore Louisiana fields listed in Table 4, p. 22 entitled "Major Offshore Fields in the statistical sample" (see attachment A) and in Table 6, p. 24 entitled "Smaller Offshore Fields in the statistical sample" (see attachment B) are hereby requested.

Thanking you in advance for your cooperation.

Sincerely yours,

THEODORE L. LYTLE, Jr.,
Bureau of Competition.

FEDERAL POWER COMMISSION,
Washington, D.C., August 9, 1974.

DONALD K. TENNEY, Esq.,
ANTHONY J. DEPHILLIPS, Esq.,
Federal Trade Commission,
Washington, D.C.

GENTLEMEN: Receipt is acknowledged of your letter of July 22, 1971, requesting that we furnish certain information concerning one production area in Southern Louisiana from our Form 15 reports. Specifically, question 1 requests the total volume of remaining dedicated reserves by reservoir and the type of gas for each reservoir for Form 15 reporting years 1965, 1966, 1967, 1968 and 1969 for the fields listed in the attachment to your letter. Additionally, you request the annual revisions, additions and annual gas volume withdrawn and also a breakdown of the actual reserve ownership by producer interest and/or by pipeline company.

Not all of this information can be obtained from the Form 15 reports. Schedule No. 3 will show by reservoir the original recoverable reserves, the annual revisions and additions, the cumulative production, the remaining recoverable reserves and the type of gas. It will not show the annual production by reservoir but only the total production from all reservoirs in the field. The production by reservoir can be derived by taking the year end remaining reserves for the previous year, adjusting for revisions and additions during the current year and subtracting the year end reserves for the current year.

The above data can either be extracted manually from the Form 15 reports or from the magnetic tapes that are prepared annually from the Form 15 filings. Deriving annual production by reservoir can only be done manually. Extracting complete Schedule No. 3 information from the magnetic tape is difficult principally due to the reservoir name changes and reservoir consolidations for reporting purposes.

The Form 15 does not break out natural gas reserves by individual producer contract. Schedule No. 3 does show what portion of the total field reserve dedication is company owned by the pipeline and what portion is from the total of producer contracts, but not by each producer.

The FPC Form 2 will show the annual volume of gas that the reporting pipeline company purchases from the given producer operator in a given field area. FPC Form 301–A or 301–B reports are filed by the producers to report sales to the individual pipelines. Form 301–A is a annual form filed by all producer operators reporting total annual sales. Form 301–B is filed only by producer operators with sales in excess of two-billion cubic feet annually and the sales are broken down by individual contract rate schedules. In both cases the forms are filed by the producer operator with any signatory party to the gas purchase contract having the option of filing his interest separately.

Neither of these forms give a complete breakdown of production by the individual interest owner. Also, neither of these forms report the natural gas reserves belonging to each individual interest owner.

Form 15 was designed to aid in the processing of certificate applications made by the pipeline companies and to maintain surveillance of the gas supply of the pipeline companies. When we make an analysis of reserves dedicated to a pipeline in a field or reservoir we are concerned with the total reserve dedication, not which part is dedicated by each producer interest owner.

Subject to scheduling so as to avoid interference with their regularly assigned responsibilities, the Gas Supply Section of the Bureau of Natural Gas could provide the information requested that can be obtained from Schedule 3 of the Form 15. There is no data in Form 15 responses that would enable us to apportion dedicated natural gas reserves data by reservoir to individual producers. Indeed, determining individual interest ownership and participation is as much a legal problem as an engineering problem.

The estimated cost for the manual portion to respond to your request is in the range of $25,000, exclusive of the cost of programming, computer time and related verification. We would need appropriate assurances from your Executive Director that the Federal Trade Commission would reimburse us for all costs incident to the study before undertaking it. If the Federal Trade Commission has it own computers, and computer personnel, you may prefer to purchase the tapes containing the Form 15 data and perform your own study. You also may prefer to do your own manual calculations, and we will be happy to show you how to do this. However, a qualified individual is essential for the manual phase of the work.

Question No. 2 relates to "nondedicated reserves". We do not, of course, have the pipelines report reserves that are not dedicated to them, and thus we cannot supply any assistance in this regard.

You also request that Mr. Wald designate an economist to whom you may have access whenever the need arises. In further conversation with Mr. DePhillips, it appears that you do not wish an economist but instead need an expert from the gas supply section. In either event, as I have previously stated, appropriate technical personnel will be made available to you for consultation upon request to me. I suggest that it will save you time, and us time, too, if you will advise me in each instance of the subject matter of your inquiry and leave to me the responsibility for providing an expert in the area of your particular inquiry.

At our previous meeting, you requested assistance in comprehending the techniques of contesting reserve data in connection with a pipeline certificate case. Kennedy Richardson, one of our lawyers, is responsible for trying such a case at this time. You should contact him directly to arrange an appointment to review the Northern Natural case. After that meeting, if you wish any supplementary information, we will be happy to supply it.

Very truly yours,

GORDON GOOCH, *General Counsel.*

FEDERAL TRADE COMMISSION INTERVIEW REPORT

Name and official position: Gordon Gooch, General Counsel; Stephen Wakefield, Attorney; Edward Albares, Bureau of Gas; Lawrence R. Mangen, Supervising Natural Gas Eng.

Firm name and address: Federal Power Commission, 4th & G Sts., Washington, D.C.

Place of interview: Same as above, December 1, 1970.

In the matter of Area Rate Proceeding (So. La. Area-FPC Docket AR 69–1), the FPC ordered producers to report certain reserve data by separate questionnaires for the Onshore and Offshore Areas in Southern Louisiana. At this interview, the reported data for year-end 1969 was discussed.

Mr. Mangen, at this interview and in testifying at the hearings, said the purpose was to obtain reserve data and do a sample audit of these data as they pertain to uncommitted reserve figures reported by the producers.

The questionnaire was sent to all the producers in the Southern Louisiana area, Federal Domain and the On-Shore Area. Attached hereto, Exhibit No. 7, Docket AR 69–1 shows the names of all the producers in these areas which responded. Mr. Mangen said that those who didn't either have any uncommitted reserves or were small producers. In the latter case, the effect on reserve data would be negligible.

The data were gathered by B. L. Sledge, of Humble Oil Refining Company. The data were then compiled and audited by Arthur Young & Co., Certified Public Accountants.

The FPC then sent an auditing team to several of the companies to evaluate data to determine the accuracy of those submitted. Mr. Mangen said that all could not be audited because of a deadline in the proceedings. He said, however, he believed the sampling procedures decided upon would provide an accurate indication of the validity of the figures submitted.

The short of it, Mr. Mangen advised, the audit showed that the figures submitted by the producers were accurate. Although the FPC staff audit noted differences these were within permissible limits since determinations of reserves are not made on a basis of exact scientific equations.

As a result of this survey, the FPC determined that producers were not withholding reserve data in the uncommitted shut-in gas completion area in 1969.

As a further check, a search was made of the records of United States Geological Survey and Louisiana Department of Conservation well data to determine if any company which had not reported any uncommitted reserves had completed a discovery gas well in So. La. in the past ten years and cross-checked against documents of the La. Dept. of Conservation to determine the status of the discovery gas wells. The result: FPC was unable to find any discovery wells for which the gas was neither committed nor covered by the uncommitted reserves questionnaires. (See Testimony of Lawrence R. Mangen and Victor H. Zabel)

The inquiry turned toward the question of whether producers could withhold reserve data relating to expendable or stratigraphic wells. These are tests which for the most part do not culminate in the construction of a full scale well. The penetration is not as complete as a full scale well, but one, nevertheless, which may result in finding some gas accumulations.

The question was asked where one could obtain a census of such wells. Mr. Magen said the Louisiana Dept. of Conservation would have such data in its records. It would however, take a long time to go through the records. Moreover, the records do not always clearly differentiate a stratigraphic well test from other well tests.

Mr. Mangen, and Victor Zable, also of the FPC staff, testified in AR 69–1 as to the validity of the procedures used in auditing the uncommitted reserves for the area. Comparable data was also verified in AR 69–1 as to shut-in gas completions in the Federal Domain. This latter data was submitted at producer request to show that only a few wells were uncommitted (that most of the shut-ins were already committed to contract.)

Messrs. Mangen and Albares indicated that producers do not make individual reserve estimates for AGA purposes. Rather, the Subcommittee makes the reserve estimates from data furnished by the producers. The FPC obtains reserve estimates prepared by pipelines on Form 15.

Finally, it was emphasized that individual producer reserves, as well as individual exploratory drilling activity, is zealously guarded by the producers. In most cases, there is a desire to keep such information secret for competitive reasons; in other words, they have a strong "proprietary interest".

Mr. Gooch was advised that the undersigned may seek out other personnel in the FPC for further discussion. Mr. Gooch, though formally cooperative, manifested a definite coolness toward the undersigned and their efforts to obtain information. He said that he must be informed in writing of the person sought to be interviewed and the date.

Respectfully submitted.

William P. Diener,
Anthony J. DePhillips,
Attorneys, Bureau of Competition.

Exhibit 2.—Response of Gulf Oil Corp. to the Testimony of James T. Halverson

Gulf Oil Corp.,
Governmental Relations Deparment,
Washington, D.C., July 12, 1973.

Hon. Philip A. Hart,
Chairman, Antitrust and Monopoly Subcommittee, Russell Office Building, Washington, D.C.

Dear Senator Hart: I am attaching hereto a copy of a statement being filed with the Antitrust and Monopoly Subcommittee by Warren M. Sparks representing Gulf Oil Corporation in the capacity of Regional Attorney which expresses the views of our Corporation with respect to the statements made before your Subcommittee on natural gas reserves.

This statement is being furnished to the Subcommitee with the request that it be made a part of the proceedings of the Natural Gas Industry hearings held on June 27 and 28.

Very truly yours,

CLAUDE C. WILD, JR.

RESPONSE OF GULF OIL CORPORATION TO THE TESTIMONY OF JAMES T. HALVERSON, DIRECTOR OF BUREAU OF COMPETITION OF THE FEDERAL TRADE COMMISSION WITH REGARD TO REPORTING NATURAL GAS RESERVES TO THE AMERICAN GAS ASSOCIATION

Gulf Oil Corporation's response to the testimony of James T. Halverson is directed primarily at his charges that the documents Gulf furnished the FTC in response to a subpoena[1] reflect that estimates of proved reserves submitted to the South Louisiana Subcommittee of the AGA were significantly lower than the estimates of proved reserves reflected on the Company's reserve records. It will be the principal purpose of this response to show that the documents furnished the Federal Trade Commission do not support this conclusion or others of similar import.

THE IMPROPRIETY OF THE PROCEDURES USED

Before discussing the merits of Mr. Halverson's testimony, Gulf wishes to protest the "star chamber" manner in which these charges have been brought against it. The procedure by which the charges were made is, itself, an anomaly. Mr. Engman, Chairman of the FTC, stated that he was "not in a position to discuss the substance of these investigations" because to do so would "raise the possibility that my participation might be challenged in any related adjudicatory proceedings which may come before the Commission." (Tr. 196) He left the matter to Mr. Halverson. Thus, the Chairman of the Commission eschewed any responsibility for the accusations to be made by Mr. Halverson.

Mr. Halverson, on the other hand, made it plain that "my remarks are wholly my own, and do not constitute an official statement by the Federal Trade Commission or any Commissioner. The Commission has neither reviewed nor approved my testimony." (Tr. 223) The documents on the basis of which Mr. Halverson charges Gulf with "serious under-reporting" of natural gas reserves were furnished to the Commission in response to an investigatory subpoena in FTC Investigatory File No. 711–0042.

Section 4.10 of the FTC's Procedures and Rules of Practice provides:

"(a) The records of the Commission which are exempt from availability for public inspection and copying pursuant to the provisions of § 4.8 include:

* * * * * * *

"(6) Investigatory files complied for law enforcement purposes except to the extent available by law to a private party, * * *

* * * * * * *

"(c) * * * Except to the extent that the disclosure of information contained in the confidential records of the Commission is specifically authorized by the rules in this chapter or by the Commission, or to the extent that its use may become necessary in connection with adjudicative proceedings, it may be disclosed, divulged, or produced for inspection or copying only under the procedure set forth in § 4.11."[2]

The procedure provided in Section 4.11 was not followed here. In fact it could hardly have been complied with, since Mr. Halverson, by his own admission, made the revelations in his testimony on his own behalf and without the foreknowledge of the Commission.

Section 10 of the Federal Trade Commission Act (15 USCA 50) provides:

"Any officer or employee of the commission who shall make public any information obtained by the commission without its authority, unless directed by a court, shall be deemed guilty of a misdemeanor, and, upon conviction thereof, shall be punished by a fine not exceeding $5,000, or by imprisonment not exceeding one year, or by fine and imprisonment, in the discretion of the court."[3]

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[1] In the FTC's Investigation of Reporting of Natural Gas Reserves, File No. 711–0042.

[2] See *Federal Trade Commission* v. *Green*, 252 F.Supp. 153 (SD NY 1966).

[3] Section 4.10 of the FTC's Procedures and Rules of Practice reiterates the statutory prohibition and penalties against disclosure of the Commission's confidential records "without its authority, unless directed by a court."

Nevertheless, Mr. Halverson, on his own responsibility, revealed facts allegedly contained in these confidential records of the Commission. He made serious accusations of wrongdoing on the basis of records which were not only required by statute to be held in confidence but are not available for testing by cross-examination or otherwise in the hearing before this Subcommittee. It was on the basis of this testimony that the Chairman of the Subcommittee closed the hearing and stated that he was "almost sorry that we had to hear testimony from * * * the Trade Commission * * * that in all cases investigated by them the AGA figures were an under-statement of natural gas reserves that were carried on the companies' own records, and you can't take comfort in that kind of news." (Tr. 527–8) The Chairman directed the Subcommittee Staff to "develop an early draft report." (Tr. 528)

Apparently, at least in the eyes of the Chairman of the Subcommittee, Gulf has been tried and found guilty of serious charges without the benefit of cross-examination of its accuser on a record which is not before the Subcommittee, and even before it was given an opportunity to answer the charges. Gulf challenges the legality of the procedure used by the Federal Trade Commission at this hearing.

THE STAFF'S LACK OF EXPERTISE LED IT INTO ERROR

Regardless of the impropriety of the disclosures, the adverse publicity given the charges, necessitates a reply to them on their merits. Gulf does not contend that Mr. Halverson's testimony is intentionally misleading, although it is difficult to comprehend some of his statements in the light of the documents furnished the FTC. We suspect that for the most part Mr. Halverson's conclusions were more the result of a lack of knowledge of the technical aspects of reserve determinations and of the manner in which Gulf makes and uses reserve estimates, than of intentional misstatements. For example, the FTC Staff's Report to the Subcommittee dated June 1973, on which Mr. Halverson's testimony is obviously based, lists the purposes for which estimates of proved reserves are made:

"Companies make estimates of *proven*[4] natural gas reserves in situations such as (1) bidding on or nominating leases, (2) deciding whether to erect a permanent platform, (3) compiling or inventorying total company reserves or supply (4) negotiating or contracting for the sale of natural gas, or for the joint or common exploration, development, production, purchase or sale of acreage, or for obtaining bank loans, and (5) filing depreciation expense schedules with Internal Revenue Service to name just a few of the situations."[5]

One would think that even the uninitiated would know that a reserve estimate made in connection with bidding on a lease would not, and in fact could not, be an estimate of "proven" reserves. Such estimates are of "potential" reserves which could not be "proven" under any definition of the term until wells are drilled. If the reserves were known before wells were drilled, most of the risks of oil and gas production would be eliminated. It is this mixing of oranges and apples by Mr. Halverson and the FTC Staff which has led them into many of their errors. The second category of reserve estimates listed above, to decide "whether to erect a permanent platform," is another illustration of the point. After an offshore lease is purchased, an exploratory well is normally drilled from a floating drilling vessel or a movable rig. If oil or gas is found, the lessee has more information than he had when he bid on the lease, but by no means enough to determine the "proven" reserves on leases normally containing 5,000 acres. He may have to drill more than one exploratory well before he will have sufficient geologic information to make an estimate, not of "proven" reserves, but of the "potential" reserves, which would justify the expenditure of the several million dollars necessary to build a permanent platform.

The Staff report does reflect that some comprehension that reserve estimates made for building a projected platform are not estimates of "proven" reserves. Page 13 of the Report states "* * * when a producer has drilled a well on a particular tract and is considering spending millions of dollars to place a platform on the tract, this expenditure quite naturally has to be fully justified so a *new* estimate of the reserves in that tract is made *This estimate often is broken down into several categories of reserves with proved reserves being one of the categories.*"

Mr. Halverson in his testimony apparently overlooked this distinction between categories of reserves when he undertook to compare "proven" ledger reserves with "higher estimates" for "other in-house purposes such as decisions whether to build a drilling platform on a tract or to sell reserves to a pipeline company. Sometimes the difference is very significant—amounting to over 200%." (Tr. 227–8) It is hardly surprising that the potential reserve estimate to justify erection of a platform might be 200% of the proven reserves at the time. The purpose of the platform is to find out by drilling wells whether the potential reserve estimate is correct or not. When a permanent platform is constructed, it may require the drilling of numerous wells before the proven reserves will be known. What has been said of reserve estimates for building platforms is also true of estimates with regard to the sale of gas to a pipeline. Normally, when a gas sales contract is negotiated with a pipeline only part of the acreage has been drilled, i.e., only part of the potential reserves are proven. Possible additional reserves may or may not be proven by additional drilling.

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[4] All emphasis added except where otherwise noted.

[5] Staff Report, p. 7.

All of these factors enter into the determination of whether a particular reserve estimate can be considered to be an estimate of "proved" reserves. This is the reason for the precise language in the American Gas Association's definition of "proved reserves." To make this language readily available we have excerpted the definition from the AGA-API 1971 Reserves Report, and attached it as Appendix A hereto.[6]

Every step in the exploratory process requires an estimate of potential reserves to justify the risk of the investment under consideration. If potential reserve estimates for drilling exploratory wells, or building offshore platforms, or for contracting for the sale of gas were reported to the AGA as "*proven*" reserves, the results would be highly misleading. This is illustrated by the fact that 9 out of 10 wildcat wells are dry and find nothing at all and only one out of 38 discover an accumulation of hydrocarbons with an ultimate reserve in excess of one million barrels of oil or its gas equivalent, by no means a large field.[7] It should be obvious to all that to report reserve estimates upon which exploratory expenditures are based to the AGA as "proven" reserves would be the rankest kind of misinformation. The old adage that "If wishes were horses then beggars would ride," might be one way of distinguishing potential and proven reserves. Mr. Justice Jackson stated the proposition in somewhat more dignified language nearly forty years ago, when he said: "* * * The service one renders to society in the gas business is measured by what he gets out of the ground, not by what he puts into it, and *there is little more relation between the investment and the result than in a game of poker*." [8]

Perhaps Mr. Halverson's failure to understand and properly interpret the various types of reserve estimates furnished to the Commission in response to the subpoena is due to the fact that apparently no one with the technical training necessary to evaluate these documents has been assigned by the FTC to the natural gas investigation. Mr. Engman, Chairman of the FTC, testified that "currently, two attorneys, one economist and one law clerk are assigned to the project." [9] The Staff Report [10] reflects that in response to the subpoenas, Gulf, on November 20, 1972, submitted 12,000 documents; Union Oil Company of California, on February 27, 1973, submitted in excess of 14,000 documents; and Continental Oil Company, on April 25, 1973, submitted over 28,000 documents. It passes understanding that four people, wholly untrained in the complex technicalities of reserve estimates and their utilization, could, in so short a time, have reached such firm conclusions with regard to such a mass of data.

THERE WAS NO "SIGNIFICANTLY LOWER" REPORTING OF RESERVES BY GULF

The Staff Report states:

"Notwithstanding the conservative nature of these estimates, comparison between these in-house compilations of lease-by-lease estimates of proved reserves with estimates submitted by members of the very same companies to the South Louisiana Subcommittee of the American Gas Association has revealed *very significant discrepancies* between the estimates. The estimates of proved reserves submitted to the South Louisiana Subcommittee of the AGA have been found to be *significantly lower* than the estimates of proved reserves reflected in the corporate compilation. Some of the estimates are approximately equal, but *no corporate estimate has been found to date that is lower than the estimate submitted to the Subcommittee.* At times, the estimate for a given field, as refleced by company books, is as much as *ten times* the estimate submitted for that same field in the same period to the Subcommittee."

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[6] The definition has been substantially unchanged at least since 1963.

[7] Bulletin of The American Association of Petroleum Geologists, Vol. 56, p. 1147, July 1972.

[8] *Federal Power Commission v. Hope Natural Gas Company*, 320 U.S. 591, dissenting opinion at 649 (1944).

[9] Statement p. 11.

[10] Page 12.

Apparently on the basis of this report, Mr. Halverson testified:

"The estimates of proved reserves submitted to The South Louisiana Subcommittee of the AGA have been found to be *significantly lower* than the estimates of proved reserves reflected in the corporate compilations. Some of the estimates are approximately equal, but *no corporate estimate has been found to date that is lower than the estimate submitted to the Subcommittee.*"

In his oral testimony Mr. Halverson stated that there was under-reporting of reserves *"as high as ten to one"* (Tr. 243).

These statements are demonstrably incorrect as applied to Gulf. To some extent, they are the result of a misunderstanding of the manner in which Gulf's reserve ledgers are kept, so that the comparisons made are not comparable. On the other hand, some of the statements simply do not square with comparable data available to Mr. Halverson and the Staff.

Some understanding of the manner in which natural gas reserves are compiled by the American Gas Association and the American Petroleum Institute is necessary to understand both the reserves furnished the AGA and Gulf's reserve ledgers. In the first place, *it should be understood that the AGA does not estimate reserves of dissolved gas.* "Dissolved" gas, commonly known as "casinghead gas",[11] is so-called because in the reservoir it is dissolved in the oil and separates from the oil only upon production. Subcommittees of the API, similar to those of the AGA, estimate the reserves of oil. Since the volume of the dissolved gas in the oil is directly related to the oil reserves, the members of the API subcommittees also estimate the dissolved gas reserves on a field-by-field basis. A single figure reflecting the *total dissolved gas reserves for each area,* such as South Louisiana, is furnished by the API reserve subcommittee chairman to the chairman of the AGA Reserve Subcommittee for the area involved. The AGA Subcommittee includes that figure in the total reserves he furnishes to the AGA General Reserve Committee for the area. In other words, *the reserves furnished the AGA,* on a field-by-field basis by the members of the AGA subcommittee, including the Gulf employee on that committee, *do not include any reserves of dissolved gas.* They only include estimates of non-associated and associated gas in the various fields assigned to the persons on the Subcommittee. "Non-associated" gas is gas which is in no way associated with oil in the reservoir. "Associated" gas is gas in a gas cap in contact with oil but not dissolved in the oil.

Many fields in South Louisiana have multiple reservoirs, some of which contain only non-associated gas; others contain oil and dissolved gas; still others may contain oil, dissolved gas and assciated gas. For fields which contain both dissolved and associated gas, the responsibility for reserve estimates is divided between the AGA and the API, with the AGA Subcommittee estimating the reserves for associated gas and the API Subcommittee estimating the reserves for dissolved gas and reporting such reserves to the AGA Subcommittee, not on a field-by-field basis but as a total figure. These procedures for dividing the responsibility between the API and the AGA for the collection of natural gas reserves should have been well known to the Staff. They were explained in detail in the statement by Mr. B. B. Gibbs, Chairman of the AGA South Louisiana Gas Reserves Subcommittee, taken by the Staff on August 5, 1971, and in the deposition of Mr. Jack Jones, Chairman of the API South Louisiana Reserves Subcommittee, taken March 1, 1972. It was his failure to comprehend these facts which led Mr. Halverson into his most grievous errors.

Different fields are assigned to each AGA Subcommittee member for his estimate of reserves of associated and non-associated gas on a field-by-field basis. Gulf's member on the South Louisiana AGA reserves subcommittee is Mr. Cullen LeBlanc, an experienced reservoir engineer who has been an employee of Gulf in Louisiana for 20 years. He prepares his reserve estimates for the AGA from data in Gulf's files and other data available to him, without consultation with other reservoir engineers employed by Gulf who participate in the preparation of the proven reserves carried on Gulf's ledgers. During the period involved, Mr. LeBlanc was assigned the duty of preparing reserves for 15 fields in the offshore Louisiana area. His estimates of associated and non-associated reserves in each of these fields were furnished the AGA Subcommittee and entered into its determination of such reserves for the South Louisiana area. His estimates included no dissolved gas reserves.

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[11] Also sometimes referred to as "solution" gas.

Gulf prepares book reserves on a lease-by-lease basis. They cover only that portion of a field which is covered by *Gulf-owned or operated leases.* Mr. LeBlanc's estimates for the AGA, on the other hand, covered the entire field, regardless of lease ownership. In 9 of the 15 fields reported by Mr. LeBlanc, Gulf owned or operated leases covering only a *part* of the field, and therefore Gulf's reserve ledger reflects only the reserves under its leases, rather than reserves for the field as a whole. Obviously, no comparison can be made between Gulf's reserves for its leases in such fields and Mr. LeBlanc's reserve estimates for the entire fields. For example, in the Vermilion Block 71 Field, Gulf's associated and non-associated gas book reserve estimate for its leases in the field as of December 31, 1970, was 25,518 million cubic feet (MMcf), while Mr. LeBlanc's reserve estimate of associated and non-associated gas furnished the AGA for the entire field was 154,469 MMcf. In the West Cameron Block 45 Field, Gulf's books show 266,997 MMcf, while the reserve for the Field furnished the AGA was 597,769 MMcf.[12]

Gulf's reserve ledger does reflect the reserves for each of the six remaining fields which were reported by Mr. LeBlanc to the AGA. Prior to 1967 the reserves for these fields on the reserve ledgers furnished the Commission reflected *only the associated and non-associated* gas reserves, and they are therefore comparable to the reserves furnished the AGA Subcommittee by Mr. LeBlanc. There is attached hereto, as Appendix B, a table which reflects a comparison of the reserves shown on Gulf's reserve ledger, and those furnished the AGA by fields, by years, for the period 1963 through 1966. Contrary to the statement of Mr. Halverson that "* * * no corporate estimate has been found to date that is lower than the estimate submitted to the Subcommittee" (Tr. 228), for all fields in every year but one, the Table shows that the reserves reported to the AGA were somewhat higher than those on Gulf's reserve ledgers furnished the FTC.

In 1967 Gulf changed the manner in which it kept its reserve ledgers to include dissolved gas with non-associated gas. This change is explained in Document Nos. 8002, 8074, 8170, 8271, 8393, 8556, 8715, 8866 and 9041, furnished the FTC. Although the Staff took the depositions of five Gulf employees on March 20 and 21, 1973, and asked numerous questions concerning the documents furnished, at no time during the depositions, before, or since, has the Staff made any inquiry with regard to the comparability of Gulf's ledger reserves and the reserve estimates furnished the AGA, although there was a dramatic change in such relationship in 1967, based on the numbers alone. The following tabulation indicates this change.

Year	Reserves (million ft.^{2} at 14.65 psia)	
	Gulf Ledger	Reported to AGA
Ship Shoal block 154:		
1966	4,769	4,884
1967	16,589	4,884
1969	17,604	4,884
South Timbalier block 131:		
1966	3,846	3,940
1967	35,265	17,764
1969	63,507	41,493
South Timbalier block 135:		
1966	37,044	37,836
1967	282,153	166,837
1969	437,801	282,465

It should have been obvious to the Staff, aside from the explanation in the documents furnished, that Gulf had made some change in the manner of keeping its records. In any event, in all fairness, Staff should have asked Gulf to explain the change which occurred. Instead, Mr. Halverson testified that "* * * although there has always been a discrepancy between the figures, this discrepancy substantially increased in 1968 and 1969, the crucial years in our study because of the reliance by the FPC upon the 1969 AGA data in their Area Rate Case for South Louisiana." (Tr. 227) He chose to assume that the change was the result of some Machiavellian scheme by Gulf to induce the Federal Power Commission to raise prices, without giving Gulf even the opportunity to explain the change.

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[12] In each instance the dissolved gas has been eliminated from the total reserve ledger figure to make the comparison comparable. This non-comparability factor will be discussed infra.

The facts are quite simple. These fields contain nonassociated, associated and dissolved gas, in addition to oil. Since the dissolved gas reserves were included on Gulf's ledger for the first time in 1967, there was a dramatic change in the relationship between the book reserves and those reported to the AGA. *The dissolved gas reserves in these fields are reported on a field-by-field basis to the API Reserves Subcommittee* which, in turn, included them in the total dissolved gas reserves for the area reported to the AGA. *They are included by the AGA in its total gas reserve estimate for South Louisiana.* By failing to make a simple inquiry, the FTC Staff has not only subjected Gulf to unwarranted accusations before this Subcommittee, but to unfavorable publicity, which no retraction could erase. It is submitted that if the FTC had seen fit to assign one person knowledgeable in the field of reserve determinations and reporting, these outrageous charges would never have ben made.

GULF HAS NO SUBSTANTIAL UNCOMMITTED GAS RESERVES

On June 25, 1973, the Chief of the Bureau of Natural Gas of the FPC issued a revised Staff Report of "A Nation-wide Investigation of Large Producer Gas Reserves Available for Sale" (Docket R–405).[13] The Report is a compilation of the uncommitted reserves reported to the FPC by the 79 largest producers in the United States, including Gulf. In response to a subpoena from this Subcommittee, Chairman Nasikkas of the FPC has furnished the Subcommittee with a copy of each of these reports, including that of Gulf. Dr. John W. Wilson, Chief of the Division of Economic Studies of the FPC included, at page 17 of his statement filed with the Subcommittee, a Table which purports to reflect the concentration of these uncommitted reserves in the four and eight large producers, for each of the various areas, and for the United States as a whole.

Since Gulf is the fourth largest seller of gas to interstate pipeline companies,[14] according to Table I of the FPC's 1971 Report of Sales by Producers of Natural Gas to Interstate Pipeline Companies, it was concluded by some of the news media, and perhaps by members of this Subcommittee that Gulf was one of the companies having the largest volumes of uncommitted reserves. Such is not the case.

As of June 30, 1972, the total uncommitted reserves for the 79 producers for the lower 48 states [15] were 3,410,064 MMcf. Gulf's report to the FPC (including Warren), a copy of which is in the hands of this Subcommittee, shows that on that date Gulf had a total of 10,406 MMcf of uncommitted gas reserves. This is only three-tenths of one per cent of the total for the 79 producers. Gulf's report to the FPC also reflects that as of December 31, 1971, it had 61,704 MMcf of uncommitted gas reserves. Between that date and June 30, 1972, Gulf committed 5/6ths of its uncommitted reserves. This can hardly be said to be an indication of any withholding of uncommitted reserves by Gulf in anticipation of increased prices.

Table I of the Staff Report also reflects that the 79 largest producers had uncommitted reserves of 1,474,437 MMcf of natural gas in offshore South Louisiana. Gulf's Report to the FPC shows that it had only 4,452 MMcf of uncommitted reserves, or 0.3% of the total uncommitted reserves offshore South Louisiana. When it is considered that the total *uncommitted* reserves for the lower 48 states of 3.4 trillion cubic feet is only 1.45% of the total *proven* reserves of 234.63 Tcf, and that Gulf's *uncommitted* reserves were only 0.3% of that 1.45%, or .0000435 of the total, Gulf's uncommitted reserves are placed in proper perspective.

The Staff Report contains the following statement:

"The Bureau's investigation has also uncovered numerous instances in which apparently *substantial amounts* of proved reserves of natural gas have been discovered in the Federal Offshore area and *not produced.*"

The Report then describes, somewhat inaccurately, the manner in which the United States Geological Survey grants suspensions of production after a discovery of oil or gas has been made. The Report continues:

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[13] This Report reflected minor adjustments to a Report issued Sept. 10, 1972.

[14] Actually, Gulf ranks second when the sales of Warren Petroluem Company, a division thereof, are included.

[15] Table I of the Staff Report.

"Our investigtion has revealed that many tracts in the Offshore have been granted frequent suspensions of production. *Documents from one company's submission indicate that 14 of their leases in the Offshore area, which is a very significant proportion, have been granted suspensions of production.* Some of these suspensions of production have extended the term of the lease seven years beyond the primary five-year term." [16]

The Report deos not identify Gulf as the company having the 14 leases which have been granted suspensions of production. Nevertheless, Gulf has assembled the information with regard to *all* of its leases in this category, for the benefit of the Subcommittee. During the period involved in the FTC investigation, Gulf had interests in 19 leases which at one time or another were granted suspension of production permits by the USGS. A lease by lease analysis of the suspensions granted, the reasons therefor, and the current status of the lease, is contained in Appendix "C", attached hereto. Appendix C can be summarized as follows:

Nine of the 19 leases which were granted suspensions for lack of a market, are now on production, markets having ultimately been secured. Three leases have been released and abandoned. Two additional leases will be released on August 31, 1973, and another one on September 24, 1973.

Some additional explanation should be made of the four remaining leases. OCS Lease No. 1256 has only 4.46 billion cubic feet of reserves which will not justify the expenditure required to place the well on production, nor the cost of laying an 11,000-foot line to reach market facilities. No pipeline purchaser has been willing to make the expenditures necessary to purchase this gas. OCS Lease No. G–1100 has one shut-in gas well, with a reserve of approximately 1.167 Bcf. The platform was destroyed in hurricane Betsy. This reserve will not justify the expenditures necessary to rebuild the platform and place it on production. Efforts to farm out the lease have been unsuccessful. Eleven oil wells were drilled on OCS Lease No. G–1609. The platform was extensively damaged by hurricane Camille, and the wells had to be plugged and abandoned. The oil reserves are insufficient to justify the large expenditures necessary to replace the platform and redrill the wells. The gas reserves are inadequate for lease fuel. If a new platform were built and new wells were drilled, there would still be no gas to sell. There is one shut-in oil well on OCS Lease No. G–1620, which contains a gas reserve of less than one billion cubic feet. The reserve will not justify the additional expenditures necessary to put the well on production.

It should be obvious that Gulf has not withheld gas from the market and that it has no substantial uncommitted gas reserves. The analysis in Appendix C of the suspensions of production granted Gulf by the USGS from time to time make it clear that the assertion in the Staff Report that substantial proven reserves "have been discovered in the Federal Offshore Area and not produced," at least as applied to Gulf, is simply not correct.

THE INNUENDO OF A CONSPIRACY IS INCORRECT

Mr. Halverson, in his testimony, concluded:

"2. The procedure of reporting reserves through a subcommittee of the American Gas Association composed of employees of major producers *could* provide the vehicle for a conspiracy among the companies involved to under-report gas reserves, but more information is needed in this area." (Tr. 224)

He conceded that " * * * no conclusive evidence has been found as yet of an actual conspiracy to under-report reserves * * *." (Tr. 230) He referred to no evidence, conclusive or otherwise, in support of his conclusion that the procedures of reporting reserves "*could*" provide a vehicle for a conspiracy. This is damnation by innuendo. As far as Gulf is concerned, there has been no conspiracy, through the subcommittee of the AGA or otherwise, to under-report reserves.

CONCLUSION

The Staff Report and Mr. Halverson's testimony are examples of uninformed conclusions reached without adequate knowledge of the subject matter and without making any real investigation to ascertain the true facts. Even a casual inquiry at the depositions, or at any other time, would have revealed the Staff's error, at least as to Gulf, of concluding that there has been "serious underreporting of proved natural gas reserves." [17] It is submitted that there is no basis upon which this Subcommittee could accept any of the charges made in the Staff Report or by Mr. Halverson.

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[16] Mr. Halverson paraphrased the Staff Report in his testimony at pages 229 and 230 of the transcript.

[17] Tr. p. 230.

The issues of an energy shortage, particularly with regard to natural gas, are too fundamental to the well-being of the Nation to be clouded by the unsupported charges and innuendos contained in the Staff Report and Mr. Halverson's testimony.

Respectfully submitted,

WARREN M. SPARKS,
Regional Attorney, Gulf Oil Corp.

VERIFICATION

The undersigned, Warren M. Sparks, Regional Attorney for Gulf Oil Corporation at Tulsa, Oklahoma, prepared the above and foregoing Response, with the assistance of other Company personnel, and states that to the best of his knowledge and belief, the facts stated therein are true and correct.

WARREN M. SPARKS.

Subscribed and sworn to before me, this 12th day of July, 1973.

R. JACKSON, *Notary Public.*

My Commission Expires: May 15, 1976.

APPENDIX A

[From "Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas in the United States and Canada and United States Productive Capacity as of Dec. 31, 1970."]

Natural gas liquids reserves are classified on the basis of the type of occurrence of the gas in the reservoir; that is non-associated and associated—dissolved.

PROVED RESERVES

The Committee's definition of proved reserves defines the current estimated quantity of natural gas and natural gas liquids which analysis of geologic and engineering data demonstrate with reasonable certainty to be recoverable in the future from known oil and gas reservoirs under existing economic and operating conditions. Reservoirs are considered proved that have demonstrated the ability to produce by either actual production or conclusive formation test.

The area of a reservoir considered proved is that portion delineated by drilling and defined by gas-oil, gas-water contacts or limited by structural deformation or lenticularity of the reservoir. In the absence of fluid contacts, the lowest known structural occurrency of hydrocarbons controls the proved limits of the reservoir. The proved area of a reservoir may also include the adjoining portions not delineated by drilling but which can be evaluated as economically productive on the basis of geological and engineering data available at the time the estimate is made. Therefore, the reserves reported by the Committee include total proved reserves which may be in either the drilled or the undrilled portions of the field or reservoir.

In general, the definitions of proved reserves contained in Technical Report No. 1, "Definitions for Petroleum Statistics", of the A.P.I. have been followed in this report. It should be noted that in order to maintain a consistent continuing series, gas in underground storage is included in the total gas reserves in this report. Anyone desiring a value for gas in storage may obtain such by subtraction.

Attention is called to the fact that natural gas is a mixture of hydrocarbon compounds and small quantities of various non-hydrocarbons. In most cases the quantities of non-hydrocarbons are de minimis and do not affect the marketability of the gas. In such cases no reduction in volume for the theoretical removal of such non-hydrocarbons has been made herein. In any reservoir where the quantity of non-hydrocarbons is sufficient to render the particular gas unmarketable an appropriate reduction in the reservoir gas volume has been made to cover the exclusion of such non-hydrocarbons.

ULTIMATE RECOVERY OF GAS RESERVES

Ultimate recovery of gas and natural gas liquids reserves are estimates of the total quantity of such proved reserves which will ultimately be produced from a reservoir as determined by the interpretation of current geological and engineering information and under prevailing economic and operating conditions. Adjustments to estimates of ultimate recovery of gas reserves brought about by new information from additional drilling or reservoir production performance are recorded under extensions and revisions in the reserves reporting. The current estimate of ultimate recovery of gas reserves is the sum of the cumulative production and the remaining recoverable reserves.

DISCOVERIES

Discoveries are defined as proved reserves in newly discovered fields and newly discovered reservoirs in old fields. New reservoir discoveries include proved reserves in new segments of reservoirs that are separated from the previously proved productive area by faulting, lenticularity of the reservoir, or other subsurface discontinuity. Reserves of multi-reservoir fields, included in the new field discovery category, reflect the reserves of all reservoirs proved during the discovery year of the field. New discoveries seldom are delineated or fully developed during the year of discovery. Therefore, the year-end reserves estimates of discoveries generally represent only a part of the reserves that ultimately will be assigned.

EXTENSIONS TO RESERVES

A discovery in one year normally is delineated by the drilling of both extension and development wells during subsequent years. Drilling usually continues until the productive limits of the field or reservoirs are defined. Increases in the proved area of reservoirs result in appropriate adjustments to estimates of recoverable reserves and such changes are recorded under extensions. Changes resulting from a reduction in the estimate of the proved area are recorded under revisions.

REVISIONS TO RESERVES

The drilling of additional wells in a reservoir not only delineates the productive area but also provides additional basis geological and engineering data. Estimates of porosity, interstitial water, pay thickness and other reservoir factors may be revised by new data. Analysis of the producing history of a reservoir, including production of oil, gas and water, and pressure performance results in more accurate concepts concerning the producing mechanism, recovery efficiency and the performance of the reservoir. The composite of this new and improved information will yield more precise estimates of the ultimate recoveries and remaining reserves and result in revisions to previous estimates. Changes in reserve estimates brought about the application of cycling or other recovery techniques are included in the revision to reserves. Also, changes in reserves resulting from a reduction in the estimate of the proved area are included in revisions.

NATURAL GAS AND NATURAL GAS LIQUIDS PRODUCTION

Gas production as defined by the Committee is net production which constitutes the total volume of natural gas withdrawn from producing reservoirs less the volume returned to such reservoirs in cycling, repressuring of oil reservoirs and conservation operations. Net production as reported by the Committee is corrected for shrinkage resulting from the removal of the liquefiable portions of the gas and excludes non-hydrocarbon gases where they occur in sufficient quantity to render the gas unmarketable. Marketed gas volumes are not comparable to net gas production as a portion of the gas withdrawn from reservoirs is consumed in field operations as lease and plant fuel. Also, some gas is vented.

It is recognized that in many instances the production statistics for natural gas are available only on a total produced basis including all or a part of the liquefiable portions. In such cases the individual Subcommittee makes the appropriate adjustments to conform to the Committee's definition of gas production.

The compilation of gas production for reserve determinations involves the correlation of reported production with the specific fields or reservoirs which have been credited with proved reserves. Gas well gas production is usually reported to conservation commissions by individual wells and casinghead of oil well gas production is reported on a total lease basis. To determine production by fields or reservoirs requires that such production statistics be analyzed and specific volumes identified as to their source.

Reported production of natural gas liquids includes liquids recovered by field separation facilities on an individual lease basis and liquids recovered by plant facilities on a total plant basis. In cases where plants process gas from more than one field, plant yields are allocated to gas production and reserves of fields connected to such plants.

APPENDIX B

COMPARISON OF RECOVERABLE RESERVES REPORTED TO THE AGA WITH GULF LEDGER RECOVERABLE RESERVES YEARS 1963 THROUGH 1966[1]

[Million ft^{2} at 14.65 psia]

Comparative fields	AGA report	Ledger	AGA versus Gulf (plus or minus)	Difference, percent of Gulf
Dec. 31, 1963:				
West Delta block 27	4,906,314	3,213,142	1,693,172	+52.7
Ship Shoal block 154	4,884	4,769	115	+2.4
S. Timbalier block 131				
S. Timbalier block 135	31,434	30,649	785	+2.6
Total	4,942,632	3,248,560	1,694,072	+52.1
Dec. 31, 1964:				
West Delta block 27	4,906,314	4,697,104	209,210	+4.5
Ship Shoal block 154	4,884	4,769	115	+2.4
S. Timbalier block 131	228	228		
S. Timbalier block 135	31,907	31,122	785	+2.5
Total	4,943,333	4,733,223	210,110	+4.4
Dec. 31, 1965:				
West Delta block 27	4,892,115	4,683,267	208,848	+4.5
Ship Shoal block 154	4,884	4,769	115	+2.4
S. Timbalier block 131	3,940	3,846	94	+2.4
S. Timbalier block 135	32,190	31,398	792	+2.5
Total	4,933,129	4,723,280	209,849	+4.4
Dec. 31, 1966:				
West Delta block 27	4,642,115	4,683,057	(40,942)	−0.9
Ship Shoal block 154	4,884	4,769	115	+2.4
S. Timbalier block 131	3,940	3,846	94	+2.4
S. Timbalier block 135	37,836	37,044	792	+2.1
Total	4,688,775	4,728,716	(39,941)	−.8

[1] The S. Timbalier block 5 and Eugene Island block 238 fields were developed subsequent to this period.

APPENDIX C

WEST CAMERON, B 163, OCS 0750

5000 acres: Acquired, 5/1/60; Bonus, $3,115,000; 5-year term; Rental, $3/Acre; 1/6 Royalty Mobil .333 Operator, Exxon .333, Gulf .334. Original 5-year term expiration date: 4/30/65.

Well No. 1.—Comp. 11/25/60, shut in gas well, 2895 MCF 14 BCPD.

U.S.G.S. letter 3/31/65: "attempting to establish market to gas-suspension of production granted through 4/30/66—minimum royalty $15,000".

U.S.G.S. letter 4/11/66: "attempting to establish market—suspension of production granted through 4/30/67—payment of minimum royalty $15,000".

U.S.G.S. letter 3/16/67: "suspension through 4/30/68—minimum royalty $15,000".

Mobil Letter 3/8/68: "Transco proposed to extend pipeline to Block 163 and 289; but on 8/25/67 withdrew proposal—negotiating with Roy H. Bettis of Dallas to purchase and transport gas for resale onshore."

U.S.G.S. letter 4/16/68: "suspension through 4/30/69" minimum royalty.

First Production No. 1 February, 1969. Gas Pipeline "Tidal System: producing facilities."

Well No. 1—Shut in 1/31/70, water production.

Well No. 1.—6/30/70, to be plugged.

C & K Offshore Company farmout well plugged and abandoned 5/15/70.

W.C. B 163 dropped August, 1970.

WEST CAMERON, BLOCK 176, OCS 0762

5000 acres, acquired 5/1/60; bonus $6,167,010, 5-year term; rental, $3/acre, 1/6 royalty; Mobil .333 operator, Humble .333, Gulf .334, Original 5-year term expiration date 4/30/65. (located in East Cameron B64 Field.)

Well No. 1.—Dry 10/16/60.

Well No. 2.—Completed 10/25/63 I.P. 204 BCPD & MCFGD; 2-D I.P. 237 BCPD & 5155 MCFGD.

U.S.G.S. letter 4/5/65: "Well No. 2 capable of producing in payable quantities—no market for gas—suspension of production granted through 4/30/66—minimum royalty $15,000".

U.S.G.S. letter 4/1/66: "suspension of production granted through 4/30/67—minimum royalty payment".

Well No. 3.—8/66 comp. 168 BCPD 5608 MCFPD shut in.

U.S.G.S. letter 3/6/67: "2 well shutin—a line capacity problem of Tenn. Gas Transmission delays putting wells on production—suspension of production through 4/30/68—minimum royalty payment."

U.S.G.S. letter 4/18/68: "negotiation for gas sale continuing—suspension of production granted through 4/30/69—minimum royalty.

First Production 1/4/69. Tenn. Gas Transmission Pipeline.

WEST CAMERON, B 289: W. CAMERON, B. 163 FIELD, OCS 0752

5000 acres acquired 5/1/60; bonus, $3,115,005, 5-year term; rental, $5/acre, 1/6 royalty: Mobil .333 operator. Humble .333. Gulf .334. Original 5-year term expiration data 4/30/65.

Well No. 1.—Comp. 11/25/60, shut in gas well I.P. 2807 MCFGD.

Well No. 2.—Comp. 3/30/61, I.P.5BCPD & 2315 MCFGD.

Mobil letter 3/29/65: "unsuccessful in arranging gas sale due to limited reserves".

U.S.G.S. letter 3/31/65: "attempting to establish gas market—suspension of production granted through 4/30/66—minimum royalty—$15.000".

U.S.G.S. letter 3/16/67: "suspension of production—minimum royalty—through 4/30/67."

U.S.G.S. letter 3/16/67: "suspension of production—minimum royalty—through 4/30/68".

Mobil letter 3/18/68: "Transco proposed extension of pipeline; but withdrew proposal 8/25/67."

U.S.G.S. letter 4/16/68: "suspension granted—minimum royalty through 4/30/69."

First Production March 1969. Gas Pipeline "Tidal System: Facilities."

No. 1 well.—4/70, 7 BCPD 2238 MCFGD 60 RWPD—Off 12/12/70—unsuccessful workover 1/24/71.

No. 2 well.—9/69, shut in excessive water production.

No. 3 well.—4/70, 5 BCPD 5330 MCFGD 91 BWPD—Off 8/6/70, excessive water—plugged back and recomp 4/7/71 22 BCPD 3670 MCF producing to date.

EAST CAMERON BLOCK 125S/2 (OCS 0528)

Gulf has a $\frac{1}{16}$ working interest in 2500 ac. which were acquired from Spencer Chemical Company in $\frac{9}{64}$. Kerr McGee is the operator with $\frac{15}{16}$ working interest.

Kerr McGee completed as a shut in gas well the # 1 OCS 0528 on May 1, 1960. On IP from perforations 9723–38: 9740–50 and well made 7000 MCFG on ¼″ ch. with TP 6800#. On July 11, 1961 Kerr McGee made application to Director, USGS, for Suspension of Production under provision of 30 CFR 250.30 on the grounds of lack of transportation facilities for disposition of the gas.

In letter of July 31, 1972 the USGS requested a plan of development for additional wells by February 1973. Due to the lack of commercial reserves, it was impossible for Kerr McGee and Gulf to establish a plan of development and it was decided to attempt to farm out the lease. This plan was unsuccessful due to the unattractiveness of the prospect and it was finally decided to let the lease expire in August 1973.

SOUTH MARSH ISLAND, BLOCK 8, OCS G-1179

3146 acres, acquired 3/1/62: bonus, $3,104,200, 5 year term; 100% Gulf; Rental, $3/acre, 1/6 Royalty; Original 5 year term expiration date 2/28/67.

No. 1.—Dry and abandoned 7/7/62.

No. 2.—Dry and abandoned 7/31/62.

No. 3.—Dry and abandoned 6/4/64.

No. 4.—TA 6/23/64.

No. 5.—St'd out of No. 4 1/20/65.

No. 6.—Dry and abandoned 2/27/65.

No. 7.—Completed 3/23/65 FARD 36 BCPD and 2400 MCF TP 2250 #S.I.

No. 8.—P&A 10/10/67.

U.S.G.S. letter 2/2/67; "No. 7 completed—paying quantities—no market for gas granted suspension of production through 2/29/68–pay minimum royalty $9441." Well No. 8 P&A 10/10/67.

U.S.G.S. Letter 2/17/69: "Suspension of production through 2/28/70".

U.S.G.S. Letter 1/21/70: "Gulf effort for joint interest well unsuccessful reviewing full interest risk well—can not negotiate suitable market for small gas reserve—suspension of production granted through 2/28/71".

U.S.G.S. Letter 1/25/71: "Gulf's lease program is review rather than exploratory—should not request another suspension without lease activity.

U.S.G.S. Letter 2/29/71: "Possibility of drilling deep test—suspension granted for 6 months, through 8/28/72".

Gulf Letter 7/10/72: "Negotiating farmout to Ocean Drilling and Exploratory Company hold 1/12 ORR—well to 16,500'."

U.S.G.S. Letter 8/2/72: "Farmout to Odeco for No. 9 well—suspension through 2/28/73".

Odeco OCS 1179 No. 9 Dry 9/1/72.

S.M.I. Block 8 dropped 2/22/73.

SOUTH MARSH ISLAND, BLOCK 16, OCS 1184

Acquired 5/1/62; Bonus, $5,115,500; 5 year term; Rental, $3/acre. ⅛ royalty; Gulf .50, Mobil .50 Operator. Original 5-year term expiration date: 4/30/67.

Mobile Well No. 1.—Dry, 8/5/62.

Gulf assigned its interest to Dixilyn Corporation, Sid Richargson Carbon Company, LL & E and Amerada and retained 1/24 ORR or a ¼ W.I. 11/7/65.

Dixilyn Well No. 2.—Completed and shut in 3/8/66.

No. 2 I.P. 168 BOPD.

No. 2–D I.P. 48 BCPD. 3000 MCFGPD.

Gulf elected to retatin a 1/24 ORR. 6/1/66.

Gulf elected to retain a 1/24 ORR. 6/1/66. Mobile elected to participate.

First Production OCS 1184, 1/10/71. Sea Robin Pipe Line Company.

SOUTH MARSH ISLAND BLOCK 29 (OCS 1189)

Gulf acquired its interest in OCS 1189 from British-American in July 1966. At the time of acquisition Gulf owned ¼ interest down to 14,405′ with the remaining interest being ¼ being owned by Atlantic Richfield and ½ owned by Shell. Below 14,405′ the lease was owned jointly by Gulf and Atlantic Richfield.

Shell was holding the lease by virtue of a suit in oil well, the #3 OCS 1189. Gulf had a 1/12 override in this well.

In June, 1969 Gulf, Shell, and Atlantic Richfield farmed out to Tenneco their interests in the lease. Tenneco drilled and completed their #A–4 well in Feb. 1971 as a gas well. Gulf now has a 1/12 working interest down to 14,405′ and 50% below this depth. Through April 1973 the A–4 well has produced 4.12 billion CF of gas. Sold by contract 7/29/71, production began 1/8/72.

SOUTH MARSH ISLAND, BLOCK 48, OCS #0786

OCS–0786 Lease is owned equally by Mobil Oil Corporation and Gulf Oil Corporation and is operated by Gulf. The lease is dated May 1, 1960 with a five year primary term, ⅙ royalty, and covers the entirety of Block 48 comprising approximately 5,000 acres.

Well No. A–2 was completed as the initial producing well on March 25, 1961. It produced on test at the rate of 12 barrels of condensate per day with a gas condensate ratio of 151,000 cubic feet of gas per barrel of condensate.

During 1961 and 1962 wells A–1, A–1D, A–2 and A–4 were drilled on the lease and completed as capable of producing gas and condensate.

During this same period well Nos. 1, 2, 3 and 3–A were drilled and abandoned.

A gas sales contract was entered into with Transcontinental Gas Pipeline dated April 4, 1961 for the gas reserves underlying OCS–0786 in South Marsh Island as well as reserves in other fields. Anticipating that the pipeline construction would be complete and operative, Transco committed itself to take a minimum of 4400 MCF of gas per day effective January 1, 1965. When their line was not complete to South March Island Block 48 by January 1, 1965, Gulf and Mobil agreed for them to transfer the minimum take to South Marsh Island Block 23 Field leases also jointly owned by Gulf and Mobil. When Transco failed to take the required minimum they submitted to Gulf payment based upon minimum take requirements. Gulf then submitted the royalty due the U.S.G.S. by check No. 4484.

Transco extended its lines to platform "A" and "B" on the subject lease in December, 1965 and January, 1966. Deliveries were not begun immediately because of down hole mechanical problems on certain wells on the "B" platform and drilling operations in progress on the "A" platform.

We were able to begin deliveries to Transco on May 23, 1966 at the rate of approximately 50 million cubic feet per day.

The requests for suspension of production to the U.S.G.S. were submitted because the lease could not be placed on production until a gas pipeline was laid to it and this could not be accomplished until adequate reserves were discovered, a gas contract entered into and the line was physically in place. It should be remembered that though the primary term of the lease was up on April 6, 1965, that a firm contract had been executed in 1961 for gas from the lease to be taken effective January 1, 1965, and through the pipeline did not reach the lease until the end of the year, take or pay money was paid to the interested parties for the year 1965.

EUGENE ISLAND, BLOCK 237, OCS G-0981

OCS G-0981 Lease, dated June 1, 1962 provides for ⅙ royalty (.16667) a 5 year term, covers the entirety of Block 237 containing approximately 5000 acres and is owned by Gulf Oil Corporation.

The subject lease was established as a productive lease by the completion of well D-1 as an oil producer on August 25, 1965. Wells D-2, D-3, D-4 and D-6 drilled on this lease did not encounter commercial production and were abandoned. Since no other wells were productive on the "D" platform, a mud line completion was made on Well D-1 to permit the platform to be used in another area and to await other development in the area.

Well E-2 was directionally drilled from another lease (OCS G-0982) to test another portion of the lease. It encountered gas sands which were tested. Operations on E-2 were suspended on May 28, 1966 to await additional development and the installation of a gas line in the field.

Of the first 6 wells drilled on this lease, five were from platform "D" and one was from platform "E" located on an adjacent block. Four wells were abandoned, one was completed as capable of producing oil and one was completed as capable of producing gas. It was not economically feasible to establish producing facilities for the oil well which was not located in the same area as the gas well. The gas well could not be produced because there was no gas line in the vicinity. During the early years of production these were unsufficient reserves to justify the cost of laying a gas line to the field.

A gas sales contract was executed with Sea Robin Pipeline on August 19, 1971. They completed the laying of a line into the area of platform "E" and received their first delivery on January 29, 1972. Well E-2 was connected and began delivery of gas and condensate to the system.

Additional drilling during 1972 to further extend the limits of the gas productive area of the lease was unsuccessful.

EUGENE ISLAND, BLOCK 238, OCS G-0982

OCS G-0982 Lease, dated June 1, 1962, provides for ⅙ royalty (.16667), a 5 year primary term, covers the entirety of Block 238, which contains approximately 5000 acres and is owned by Gulf Oil Corporation.

Well A-1 was completed as a commercial oil producer on this lease on February 29, 1964. Additionally wells A-2, A-3, A-4 S.T., A-5, A-6, E-1, E-3, E-4, E-5, E-6, F-1, F-2 and Well No. 2 were drilled on this lease. By December 1, 1967, all wells on "A" platform had ceased to produce and no other production had been established. Subsequent workover operations did restore A-4 and A-2 to production which continued until 1971.

Additional production was encountered when E-6 was drilled in 1971 but it could not produce since there was no gas pipeline available. Additional reserves were encountered upon the drilling in 1972 of F-1 and F-2 wells in another part of the lease. Efforts to extend this productive area between the "A" and "E" platform in 1972 were unsuccessful.

A contract was executed on August 19, 1971 with Sea Robin Pipeline. Their pipeline reached Gulf's "A" and "E" platforms and production was begun on January 29, 1972 from the gas wells on these platforms.

SHIP SHOAL, BLOCK 176; OCS 0589

OCS–0589 Lease, dated September 1, 1955, provides for ⅙ royalty (.16667), a 5 year primary term, covers the entirety of Block 176 comprised of approximately 5000 acres and is owned equally by Gulf Oil Corporation and Exxon Company and operated by Gulf.

On September 7, 1956 a joint operating agreement was entered into among Gulf and others which pooled 40 acres out of 4 blocks with a common corner, which included OCS–0589, to form a 160 acre square for the purpose of drilling a test well to approximately 14,000 feet located on tract 176 (OCS–0589).

Well A–1 was drilled and completed as a gas well on February 4, 1957.

Well No. A–2 was drilled and abandoned. A farmout agreement from Gulf to Humble Oil and Refining Company (Now Exxon Company, U.S.A.), except as to the above referred to 40 acres, was executed on March 31, 1967 which provided that Humble would conduct certain drilling operations on the lease. Humble was designated operator of the lease on March 29, 1967 and completed a dry hole May 30, 1967. Gulf resumed operation of the lease.

This lease was maintained in effect past its primary term by the U.S.G.S. granting annual suspension of production authority because the discovery gas well on the lease could not be produced due to lack of marketing facilities.

Gulf entered into a gas purchase contract with Tennessee Gas Pipeline Company on May 29, 1969 covering gas production from this lease.

When began delivering gas to Tennessee in **January 27, 1971.**

SOUTH TIMBALIER, BLOCK 123, OCS G–1560

OCS G–1560 Lease, dated July 1. 1967, provides for ⅙ royalty (.16667) 5 year primary term, contains 2.148.46 acres and was owned by Gulf Oil Corporation.

Gulf released all the acreage in this lease on June 25, 1973.

The subject lease was tested by directionally drilling Well I–7 from Platform "I" located on Grand Isle Block 85. The well was completed as a shut-in gas well on October 22, 1967 pending additional development.

The second well on the lease, No. 1, was spudded on October 20, 1967, and was drilled to a total depth of 13,353 feet. It was non-productive and was abandoned on November 25, 1967. A small producer with very limited reserves, a dry hole plus detailed study of seismic data in the area, and development in adjacent blocks did not justify further operations on the lease. Therefore, since the reserves encountered in Well I–7 would not economically justify the installation of the facilities required to produce the well, the lease was released.

OCS 0458

2148 acres, S/T Blk 132, Gulf WI 100%, Lease date 1–1–55.

7–17–59: Well B–2 was completed as an oil well and tested at the rate of 233 BOPD and 84 MCFD on a 2 hour test.

11–2–59: "Production Relief" granted by USGS because producing and storage facilities were not economically feasible. Extensions were granted each year through 1962.

Sept. 1962: Lease placed on production after "C" Platform was installed and Well No. C–8 was completed as an oil well.

Aug. 1972: Last producing well No. C–8 sanded up and the lease went off production.

July, 1973: All plugback and workover operations have failed to restore lease production. Farmout to Union Oil Co. of California was dry hole. Lease will terminate Sept. 24, 1973, unless drilling operations are commenced or production restored. Cumulative lease production: 259,186 bbls oil, 7,003,783 MCF gas.

OCS 0459

5000 acres, S/T Blk 133, Gulf WI 100%, Lease date, 1–1–55.

9–3–59: Well B–3 was completed as an oil well and tested at the rate of 196 BOPD and 120 MCFO on a 2 hour test.

11–2–59: "Production Relief" granted by USGS because producing and storage facilities were not economically feasible. Extensions were granted each year through 1962.

Sept. 1962: Lease placed on production after "C" Platform was installed and four additional wells were completed.

June 1970: Lease went off production.

9–28–70: USGS granted "Production Relief" while additional platform and reservoir evaluations were completed.

2–21–71: Well No. C–10D restored to production.

Oct. 1972: Lease off production.

July 1973: A workover at Well No. C–10D and the installation of gas lift facilities has the lease back on production. Well test 6–12–73 175 BOPD, 70 BWPD. Cumulative production to 6–1–73: 1,231,942 bbls oil, 1,146,052 MCF gas.

OCS 1256

5000 acres, S/T Blk. 172, Gulf WI 100%, Lease date, 6/1/62.

2/12/65: Well No. A–1 plugged and abandoned.

4/5/65: Well No. A–2 completed as a commercial gas well flowing at the rate of 2,555 MCFD.

4/12/67: "Production Relief" granted by USGS because no gas market was available.

12/8/67: S/T Block 172 was one of 6 leases presented to U.S.G.S. as a proposed Federal Unit. The USGS would not recommend a unit which included Blk. 172.

6/7/68: "Production Relief" extension granted by USGS because no gas market available. Extensions were granted each year through May 1, 1973.

6/2/72: Well No. A–3 plugged and abandoned after finding no commercial shows.

8/9/72: Ocean Drilling and Exploration Company farmout, Well No. 1 abandoned with no commercial shows.

9/9/72: ODECO Well No. 2 was abandoned with no commercial shows.

4/11/73: "Production Relief" extension granted by USGS to allow time for review of geophysical and geological data.

July 1973: The limited gas reserves of 4,460 MMCF assigned to Well No. A–2 will not justify the additional expenditure required to place the well on production, even though the well tested 2,555 MCFD on completion. It would be necessary to lay approximately 11,000′ of 8″ line to reach the Exxon market facilities. Three dry holes have been drilled on Block 172 in an unsuccessful attempt to establish additional reserves. Attempts are now being made to farm out the south half of the lease.

OCS G–1100

5000 acres, West Delta, Blk. 116, Gulf W.I. 100%; Lease date, 6/1/62.

8/24/64: Well No. B–3 plugged and abandoned as a dry hole.

4/11/65: Well No. B–8 completed as a shut-in gas well after flowing at the rate of 36 BOPD and 1750 MCFD. Reserve about 1.167 BCF.

5/10/67: "Production Relief" granted by USGS. The "B" platform was lost as a result of hurricane "Betsy" which caused well No. B–8 to be temporarily abandoned as a mud line completion.

6/6/68: "Production Relief" extension granted by USGS. West Delta Blk 117 was being developed to aid in the evaluation of Blk. 116. Extensions were granted by the USGS through April, 1971, while Blk 117 was developed.

5/12/72: Production Relief granted by USGS through May 31, 1973. All attempts to extend the productive limits of several sands from Blk 117 onto Blk 116 have been unsuccessful.

7/24/72: Well No. 1 was drilled in Blk 116 and abandoned dry.

5/23/73: "Production Relief" granted by USGS. Approximately 18 miles of seismic exploration was conducted by Gulf for further evaluation of Blk 116. Gulf is attempting to develop the lease by negotiating a farmout that will provide for the drilling of a well within 90 days.

July–1973: No farmout has been obtained to date. The limited reserves which have been assigned to the B–8, temporarily abandoned gas well, will not justify the additional expenditures necessary to recomplete the well and place it on production.

OCS G–1609

5000 acres; South Pass, Block 61; Gulf W.I. 100%; Lease date, 7–1–67.

8–14–68: Well No. A–1 completed as a shut in oil well after testing 192 BOPD and 79 MCFD on a one-hour test.

8–17–69: Hurricane Camille destroyed "A" platform and forced abandoment of all wells drilled from the platform.

2–3–72: "Production Relief" granted by USGS because of loss of production platform.

6–19–73: USGS granted extension of "Production Relief" through 6–30–74. Eleven wells drilled from the "A" Platform had to be plugged and abandoned after the platform was extensively damaged by "Camille". In order to produce the lease a new production platform would have to be set and high angle directional wells drilled. There are indications of unstable bottom conditions which would increase the cost of the platform installation. An evaluation of the lease indicates the 5 million barrels of oil reserves assigned to the lease will not justify the large expenditures which will be required to put the lease back on production. We have recently contracted for seismic services which will aid in the final evaluation of the lease. Gas reserves inadequate for lease operation. If new platform were built and more wells drilled there would be no gas to sell.

OCS G–1620

3540 acres; South Pass, Block 94; Gulf W.I. 100%; Lease date 7–1–67.

8–26–70: Well No. 1 completed as a shut in oil well after a review of the well logs indicated the well would be capable of producing hydrocarbons. Gas reserve less than 1 BCF.

9–24–70: Well No. 2 plugged and abandoned as dry hole.

5–10–72: "Production Relief" granted by USGS to wait on Humble test to be drilled on Block 93. The proposed location is only 330′ east of Block 94 and will aid in the evaluation of Block 94.

7–25–72: Humble OCS Lease 1619, well No. 2, plugged and abandoned as noncommercial. Gulf contributed $200,000 to be drilling of this offset to Block 94.

6–8–73: "Production Relief" extension granted by USGS through 6–30–74 to wait for exploratory test by Exxon on their diagonally adjacent lease OCS G–2188.

July 1973: The limited reserves assigned to Well No. 1 will not justify the additional expenditure necessary to put the well on production. One dry hole drilled on the lease and one dry hole drilled 330′ from the lease have failed to increase lease reserves. Now waiting evaluation of proposed Exxon exploratory test.

EAST CAMERON, BLOCK 161 W/2 (OCS 0544)

Gulf has .031 interest in 2343.75 ac. with Phillips and Kerr McGee. The interest was acquired from Spencer Chemical Co. in September 1964. Phillips is operator with a .625 interest and Kerr McGee is a partner with .344 interest.

Phillips completed as a shut in gas well the #1 OCS 0544 on May 1, 1960. Gulf has no interest in this well as Spencer did not choose to participate in the completion of the well which had one thin gas sand of approximately 14 net feet. Phillips and Kerr McGee completed the well from perforation 9912-16 for an IP of 43 BCPD plus 2228 MCFG on 7/64″ ch., TP 6431#, GOR 51,574/1 and gravity 52.6.

On August 9, 1960 Phillips made application to Director USGS for suspension of Production on the grounds of lack of transportation facilities for disposition of the gas.

In April, 1971 Gulf and Phillips farmed out their interests in Block 161 to Kerr McGee who drilled their #2 OCS 0544 well as a dry hole in July, 1971. In August 1971 Kerr McGee relinquished their right under the farmout agreement.

In July 1972, Phillips attempted to farm out interests in OCS 0544 to Consolidated Gas. However, due to the obvious small size of gas reserve it was impossible to interest Consolidated or any other operator in a farmout proposal.

Since Phillips, Kerr McGee, and Gulf have been unsuccessful in finding anyone interested in taking a farmout of this lease, although it has been shopped extensively, it was decided in March, 1973 to plug the well, and proceed with the abandonment of the platform and relinquishment of the lease on August 31, 1973.

Exhibit 3.—Letter to Claude C. Wild, Jr., from Chairman Engman, FTC, In Response to Views of Gulf Oil Corp. on Testimony of James T. Halverson

AUGUST 29, 1973.

CLAUDE C. WILD, Jr.,
Vice President,
Gulf Oil Corp.,
Washington, D.C.

DEAR MR. WILD: This is in response to the statement of Warren M. Sparks dated July 12, 1973, a copy of which you forwarded to me on the same date. That statement expressed the views of Gulf Oil Corporation with respect to the statements made on natural gas before the Senate Antitrust and Monopoly Subcommittee by Mr. James T. Halverson, Director of the Bureau of Competition, and me in June of this year. I have requested that Mr. Halverson respond to those aspects of Gulf's statements which take issue with statements and interpretations made by Mr. Halverson in the course of his testimony. I expect that you will be hearing from him in the near future.

I trust that you understand that Mr. Halverson and I testified at the specific request of the Subcommittee. Whenever such a request is made at a time when the Commission or its staff is examining the possibility of law enforcement activity, the Commission is faced with a dilemma in attempting to balance our obligation to Congress to respond to reasonable requests for information with our obligation to the public to enforce the antitrust laws vigorously and fairly. In this case, as in similar cases, I believe an effort was made to strike the best balance in the public interest.

I would also like to respond to two points raised in Mr. Sparks' statement. First, he objects to the Commission practice of having FTC officials appear before congressional committee stating that their remarks are their own and not those of the Commission. Let me make it clear that, in fact, Commission officials do often appear before congressional committees and present an official Commission position. However, there are other occasions when, because related matters are under investigation or in adjudication, it is felt desirable to have Commission staff personnel testify on behalf of the staff and not officially for the Commission. Testimony by staff introduced by such a disclaimer has been a common practice of virtually all independent federal regulatory agencies for many years. It is necessitated by the fact that while an agency's appointed Commissioners are the only persons with authority to issue or authorize official position statements, they must also function in an adjudicatory capacity. When specific cases come before the Commissioners for review following the rendering of initial decisions by Administrative Law Judges, they are required by law to consider the issues solely on the basis of the record, in an unbiased way. Staff members, by contrast, are under no such constraints.

Any requirement that an official Commission position be propounded before a congressional committee on any matter under investigation by or in adjudication before the Commission could have one of two undesirable results. If the official position set forth stated or even suggested conclusions concerning specific facts, the Commission could be faced with the charge that it had prejudged those issues and should therefore be disqualified to hear a case involving those issues. The same problem faces an individual Commissioner who propounds his position on specific facts at issue. The same threat of disqualification can arise because of questions posed or comments made to a Commissioner by the members of the congressional committee, and this is an additional reason why it is desirable for staff personnel to testify on their own when the subject matter of the congressional inquiry involves a matter before the Commission. If staff members could not testify on their own, the alternative to running the risk of disqualification would be no testimony at all on matters under investigation or in adjudication before the Commission. The first alternative would severely cripple the Commission's system of administrative justice while the matter would deprive Congress of needed expertise on proposed legislation. On balance, therefore. we believe the public policy requires the continuation of our present procedures.

I trust that you will understand that Mr. Halverson's disclaimer was not intended to indicate that he was testifying in the capacity of a private individual. Rather he was speaking officially as a knowledgeable and responsible member of the Commission's staff, and on behalf of the Bureau of Competition.

Secondly, Mr. Sparks stated that he felt a serious question was raised as to whether Mr. Halverson's testimony constituted a violation of confidentiality imposed by Section 10 of the Federal Trade Commission Act. I wish to emphasize that in his statements and responses before the Subcommittee, Mr. Halverson was careful not to disclose any specific data of any particular company which could be construed to be in contravention of Section 10 of the Federal Trade Commission Act. Moreover, although the Commission did not review or approve Mr. Halverson's specific testimony, an informational copy of his prepared statement was furnished to each Commissioner in advance of Mr. Halverson's appearance before the Subcommittee and he appeared with full knowledge of the Commission.

Sincerely,

LEWIS A. ENGMAN.

Exhibit 4.—Response of James Halverson to Gulf Oil Corp.'s Response to His Testimony of June 27, 1973

FEDERAL TRADE COMMISSION,
BUREAU OF COMPETITION,
Washington, D.C., February 1, 1974.

WARREN M. SPARKS,
Regional Attorney, Gulf Oil Corp.,
Tulsa, Okla.

DEAR MR. SPARKS: The purpose of this letter is to respond to the salient points raised in Gulf Oil Corporation's "Response" to statements made by me on June 27, 1973 before the Senate Antitrust and Monopoly Subcommittee. In responding to you I am requesting that Senator Hart make a copy of this letter a part of the record of the Subcommittee's hearings into competition in the energy industry. This response reflects my own views only, and does not constitute an official statement by the Federal Trade Commission.

As background to my statements before and the information submitted to the Subcommittee, I note that Chairman Engman received a letter from Senator Hart on June 5, 1973. This letter requested a detailed report on all Commission investigations relative to energy including an investigation, styled In the Matter of the American Gas Association et al., File No. 711 0042, which relates to the reporting of natural gas reserves. I am enclosing a copy of Senator Hart's letter. Chairman Engman directed me and I directed members of the Bureau of Competition to prepare a report as requested by Senator Hart. This staff response was transmitted to the Subcommittee on June 19, 1973 and I shall henceforth refer to it as the Staff Memorandum of June 19.

Senator Hart also requested that Chairman Engman, I and certain staff members appear on June 27 before the Subcommittee to testify and answer questions regarding pending Commission energy investigations. In preparing the Staff Memorandum of June 19, and in the preparation of my testimony, care was taken to avoid any disclosure of information protected by either the Commission's Rules of Practice or by the "Commitment of Confidentiality" extended by the Commission to any company in connection with File No. 711 0042.

Notwithstanding this care, Gulf alleges in its response that my appearance before the Subcommittee on June 27 was "star chamber" in manner and violative of Sections 4.10 and 4.11 of the Commission's Rules of Practice and Section 10 of the Federal Trade Commission Act (15 USC 50). Because Chairman Engman, by his letter to Mr. Claude C. Wild, Jr., Vice President of Gulf, dated August 29, 1973, has responded to Gulf with regard to these matters, it is unnecessary for me to comment further except that I shall append a copy of his letter to this letter.

Turning to the substantive allegations made by Gulf, the company at page 5 of its Response quotes from the Staff Memorandum of June 19. The quote sets forth five situations (of many possible situations) in which estimates of proved reserves are made. Gulf then contends that in three of these situations only potential as distinguished from proved reserves can be estimated. The three situations cited by Gulf are "bidding on or nominating leases"; constructing platforms for field development; and gas sales. In support of its contention, Gulf appends an AGA definition which permits reserves to be classified as proven only when the rock structure in which they are situated is drilled and tested successfully.

As you know, a rock structure containing producible hydrocarbons does not always respect lease lines and may extend into unleased land. I understand that the AGA definition of proved reserves is sufficiently flexible to cross lease lines, the test data permitting. This could occur if successful test results were obtained from drilling on leased land that is near unleased land. Accordingly, proving out reserves at least as to portions of unleased land, whether that land was being nominated for bid sale or put up for bid, is distinctly possible. Staff explained this to Gulf prior to Gulf's producing any of its bid files. I am surprised that Gulf now contends otherwise.

With regard to reserve estimates in connection with constructing platforms, it is submitted that platforms rarely if ever are constructed prior to exploratory drilling and testing and that proved reserves can and are estimated based upon such exploratory drilling and testing. Gulf appears to admit as much when it approves of staff language (Response, page 6) that an estimate prior to platform construction "*is broken down into several categories of reserves with proved reserves being one of the categories.*" Similarly, any question as to whether proved reserves are estimated in connection with sales of gas appears to be put to rest by Gulf's own admission at page 7 of its Response: "Normally, when a gas sales contract is negotiated with a pipeline only part of the acreage has been drilled, i.e. only part of the potential reserves are *proven*" (emphasis added).

It thus appears that Gulf does not seriously contend that proved reserves cannot be estimated in the various enumerated situations. Rather, the real concern of Gulf appears to be that because both proved and potential reserves may be and have been estimated in given situations, did staff exercise due care in differentiating between the two, as distinguished from comparing apples with oranges? Gulf states that "If potential reserve estimates for drilling exploratory wells, or building offshore platforms, or for the sale of gas were reported to the AGA as '*proven*' reserves, the results would be highly misleading" (Response, page 7).

I wish to assure Gulf that in comparing various reserve compilations appearing in Gulf documents, staff did not compare potential reserves with proved reserves. In comparing AGA estimates with Gulf book reserves and other estimates, only those estimates which Gulf labeled as "proved" were compared. Accordingly, the concern expressed at pages 8 and 9 of Gulf's Response over staff inexperience in handling reserve figures is unwarranted.

Beginning at page 9 of its Response and continuing until the top of page 16, Gulf takes issue with my conclusion that based on a review of submitted book reserves, AGA estimates of proved reserves have been found to be significantly lower than such book reserves. The principal points raised by Gulf are that (1) a producer often does not have an interest in an entire field reported by AGA and therefore in those instances its book reserves cover less than the entire field, (2) AGA field by field estimates do not include dissolved gas while booked reserves may, and (3) Gulf figures refute certain of my conclusions made before the Senate Antitrust and Monopoly Subcommittee.

As to the first point, it is true that the AGA purports to report proved reserves for entire fields, while producers book reserves only for those portions of fields in which they have an interest. This being so, when a producer does not have an interest in an entire field, AGA figures for that field should overstate, not understate, proved reserves relative to the booked reserves of that producer. To avoid conclusions based on comparing a whole with less than a whole, my conclusions as to AGA under-reporting have been based upon comparisons involving fields in which the producer has an interest in the entire field and hence would book reserves for the entire field. It should be noted, however, that staff has detected instances in which the AGA reported less for an entire field than a producer has booked for a portion thereof.

As to the second point, Gulf notes that AGA field by field estimates do not include dissolved gas, while from 1967 on, Gulf book reserves have. AGA defers to the American Petroleum Institute (API) for compiling field by field estimates of proved reserves of dissolved gas. Failure to have comprehended these facts is said to have led me into my "most grievious errors" (Response, page 12). Obviously, if staff had not added API estimates of dissolved gas to AGA field by field estimates, any comparison of AGA estimates with Gulf book reserves from 1967 on would be untenable. Staff in fact did perform such addition. Further, in 1966 when both book reserves and AGA field by field estimates excluded dissolved gas, staff determined dissolved reserves from producer documents and API estimates and added these respectively to book reserves and AGA field by field estimates. Once again, oranges were compared with oranges and the results concerning AGA under-reporting turned out as I reported them to Senator Hart.

The third point raised by Gulf relates to certain tables appearing as Appendix B and at page 14 of its Response. The chart in Appendix B compares certain book and AGA reserves figures for four specific years over the period 1963–1966. In thirteen of fifteen comparison, the AGA figures are higher than the book reserve figures. Staff comparisons, upon which my conclusion that in no instance to date have book reserves been found to be lower than AGA estimates, were made for the period 1966–1970. Further, they were based on remaining recoverable reserves, as against the ultimate recoverable reserve figures appearing in Appendix B and at page 14.

Remaining recoverable reserves measure the proved reserves recoverable as of the date of estimate, while ultimate recoverable reserves measure proved reserves that would be recoverable if no production of the field had ever occurred. Plainly, "remaining recoverable reserves" are more germane to the current state of supply than are ultimate reserves. They, not ultimate recoverable reserves, were used by the Federal Power Commission to measure supply in AR69–1, the South Louisiana rate case. Remaining recoverable reserves tell a different story than does Gulf's Appendix B as to the relationship between AGA and book reserves in the fields in question in 1966. They disclose that in each field book reserves were higher then AGA proved reserves.

In comparison AGA and book reserve figures, staff selected 1966–1970 because 1968 and 1969 AGA figures were relied upon by the Power Commission in deciding the South Louisiana rate case. The years 1966, 1967 and 1970 were included because they immediately precede and succeed 1968–69. Obviously, if one is investigating whether a plan existed to understate AGA reserve figures, investigation to determine whether there was such a plan should emphasize those figures, 1968–69 figures, from which rate mileage was extracted. Ratios between AGA and book reserves for 1963–1966 are not relevant in themselves but only in relation to such ratios occurring after 1966.

Gulf has included a chart at page 14 of its Response which on its face discloses a precipitous drop, commencing in 1967, in the number of AGA reserves relative to book reserves in three fields. The AGA figures exclude dissolved gas and hence any conclusion based upon the figures in the chart that AGA reserves were significantly lower than book reserves would be unwarranted. I have discussed the importance of comparing oranges with oranges and apples with apples elsewhere. The point Gulf avoids in commenting on this chart is that when API dissolved gas figures are added to the AGA figures, thereby permitting comparison with book reserves, the book reserves in all cases remain either higher than the enriched AGA figures or significantly higher.

One portion of my testimony needs correction. At page 228 of the transcript, I am quoted as saying, "At times the estimates for a given field as reflected by company books is as much as ten times for the estimates submitted for that same field at the same time." In the interest of accuracy and syntax, the transcript should read "At times the estimate for a given field as reflected by company documents is as much as ten times the estimate submitted for that same field at the same time to the American Gas Association." I have requested the Subcommittee to amend the official transcript accordingly.

At page 17 of its Response, Gulf states that its answer to a recent Federal Power Commission Questionnaire showed that it only had 0.3% of the total uncommitted reserves in Offshore South Louisiana. If Gulf seeks through the use of this percentage to refute my contention that proved reserves have been found to exist on non-producing leases that are either not reported at all or are only nominally reported to the AGA, it wholly misses the point. This is because my testimony refers to reserves reported to the AGA, and not to reserves reported to the FPC. The FPC Questionnaire asked for proved reserves "available for sale" which the Questionnaire defined as those proved reserves "which are not covered by gas purchase contracts and are not reserved for direct industrial contracts, not company use-warranty gas or not company use-fuel and feedstock." All proved reserves, whether or not "available for sale," should be reported to the AGA. Thus, proved reserves committed contractually or otherwise considered to be available for sale would not be reported in response to the FPC's Questionnaire, but should be reported to the AGA. It is interesting to note that even proved reserves existing on an as yet non-producing lease, may be committed contractually several years before the lease is in production, hence not subject to the FPC Questionnaire, but of course still subject to being reported to the AGA. In addition, testimony regarding a previous FPC Questionnaire raises some doubt whether uncommitted proved reserves existing on a lease that has no transportation facilities are considered by producers to be "available for sale." If so, these reserves would also not be reported in response to the FPC Questionnaire, but still should be reported to the AGA.

At pages 18 through 20, Gulf discusses the various reasons why it chose to apply for a suspension of production on the leases listed in Appendix C of the Response. One of the reasons I raised the issue of extending the primary term of a lease was because of our finding of instances in which proved reserves on non-producing leases have not been reported or only nominally reported to the AGA. Aside from this reason, I wish to emphasize in my testimony that Federal Regulations allowing an extension of a lease term without actual production can allow a producer's expectations of higher prices to postpone production.

Gulf alleges (Response, page 20) that no evidence was adduced concerning a conspiracy to under-report reserves. It is important to note that all my testimony did was to raise the possibility of a conspiracy, given the fact that there existed a vehicle. In that light, my testimony (Transcript, pages 224 and 225) outlining the organization of the AGA and its subcommittees and detailing the methods by which employees of private oil and gas companies estimate reserves for the AGA supports the statement that the "procedure of reporting reserves through a subcommittee of the American Gas Association composed of employees of major producers could provide the vehicle for a conspiracy among the companies involved to under-report gas reserves."

In conclusion, I wish to assure Gulf that staff has been painstaking in sifting documents and in defining terms; diligent in comparing proved reserves with proved reserves; in making certain the reserves for entire fields are compared: in ascertaining that dissolved gas is included in all comparisons dealing with total proved reserves; and judicious in selecting relevant data upon which to base conclusions.

Very truly yours,

James T. Halverson,
Director, Bureau of Competition.

Exhibit 5.—Response of Continental Oil Co. to the Testimony of James T. Halverson and Chairman Engman

Continental Oil Co.,
High Ridge Park, Stamford, Conn., *July 6, 1973.*

Hon. Philip A. Hart,
Chairman, Antitrust and Monopoly Subcommittee, Senate Committee on the Judiciary, Senate Office Building, Washington, D.C.

Dear Senator Hart: We have reviewed the testimony given to your subcommittee by Mr. James T. Halverson, Director of the Bureau of Competition, Federal Trade Commission, on June 27, 1973. Enclosed are three copies of a letter which we have sent to the Chairman of the Federal Trade Commission concerning this testimony.

We respectfully request that this letter be made a part of the record of your hearings on this subject and we are confident that, pursuant to your policy of objective fairness in conducting your hearings, such letter will be made a part of the record.

Sincerely yours,

Howard W. Blauvelt.

Enclosure.

Continental Oil Co.,
High Ridge Park, Stamford, Conn., *July 6, 1973.*

Hon. Lewis A. Engman,
Chairman, Federal Trade Commission,
Washington, D.C.

Dear Mr. Engman: This letter is written concerning the testimony given by you and Mr. James T. Halverson before the Senate Antitrust and Monopoly Subcommittee in June of this year. In view of the publicity given to such testimony, and particularly to certain conclusions drawn by Mr. Halverson, we wish to correct the record.

Continental emphatically denies that it has deliberately understated its natural gas reserves or is a part of any conspiracy to understate such reserves. Turning specifically to Mr. Halverson's testimony, we want to clear up some of his misunderstandings and misinterpretations.

First, his testimony stressed apparent differences between reserves furnished to the American Gas Association by subcommittee members and "in-house" reserve estimates for the same leases. We state categorically that the employees of Continental who serve on such industry subcommittees are conscientious, professional engineers or geologists. They discharge their duties without control, direction, instructions or guidance from Continental or any of its other personnel. In addition, it is naive of Mr. Halverson to assume that estimating hydrocarbon reserves is an exact science. Apparently he ignores the fact that engineers and geologists are attempting to evaluate the amount of hydrocarbons deep within the earth and that professions of similar qualifications frequently differ as to their conclusions.

Mr. John Kerr, the employee of Continental presently on the AGA subcommittee for South Louisiana, is coincidentally a member of our reserve group and the reserve figures he furnished to the AGA on Continental's own interest leases for 1969 and later years conform to our official booked reserves. The reserve estimates furnished the AGA by Mr. Kerr did not include the volume of "dissolved" gas attributable to these same leases, since this volume of gas was furnished to the AGA by the American Petroleum Institute. It is possible that in the past other employees of Continental serving on this subcommittee, who did not have access to our corporate booked reserves, may have estimated reserves differently from such corporate booked reserves. In all instances, however, personnel of Continental serving on such a subcommittee must evaluate the reserves of leases owned by other companies on the basis of all data then available to them.

Continental has nothing to hide with respect to its reserve computations, and we have submitted all of the relevant material requested by the Federal Trade Commission. However, we sincerely believe that testimony such as given by Mr. Halverson without a complete investigation and without informed knowledge as to the nature of the various company records submitted, has unfairly penalized our company in following our long-standing policy of cooperation with the FTC.

Second, a point was made of the difference between in-house reserve estimates for items such as the "building of a drilling platform" with the official corporate reserve records. We believe it is apparent to anyone familiar with our industry that estimates of reserves for the purpose of building a drilling platform would be prepared by representatives of a division of the company seeking corporate funds in competition with other divisions of the company. Accordingly, reserve estimates for this purpose are understandably presented on an optimistic basis. In this situation the reserve estimates include "possible" as well as "probable" reserves in undrilled locations. A high degree of risk is necessarily involved when determining future locations to be drilled. Clearly, such estimates or predictions are not accepted as corporate "proved" reserves until such reserves are in fact producing or "behind the pipe" after extensive drilling.

We are sure that review of the gas reserve documents for South Louisiana submitted by Continental may disclose other instances where optimistic estimates of recoverable hydrocarbons—including "possible" reserves—have been projected by various operating employees to obtain approval for the reworking of wells, drilling of additional wells, etc. *Exploratory* reserve computations, by definition, represent estimates of reserves by our geological group of either undeveloped or partially undeveloped tracts. In most cases, such computations would be higher and more optimistic than the "proved" reserves maintained by our reservoir engineers who use in their computations producing or "behind the pipe" reserves after bore holes have penetrated a reservoir. Geological estimates include in most instances both "probable" and "possible" reserve figures.

The misinterpretation and misuse of these different reserve estimates may well have been the reason that most of the gas producers were reluctant to furnish the data subpoenaed by the FTC. Mr. Halverson's testimony has confirmed the worst fears of the industry, i.e., that uninformed amateurs would draw false or erroneous conclusions from the thousands of internal documents which might be submitted.

Third, Mr. Halverson placed emphasis on the tax-related aspects of in-house reserve computations. It should be noted that reserve estimates are completely irrelevant with respect to *percentage* depletion under our tax laws. Reserve estimates are only used when *cost* depletion is being claimed for income tax purposes. In Continental's case, the amount of *cost* depletion as compared to *percentage* depletion is negligible. For instance, for the year 1969 which was highlighted as a significant year for the Federal Power Commission in its area rate case for South Louisiana, Continental had only eleven leases in this area where cost depletion was claimed. The total in cost depletion claimed by Continental for these leases for 1969 was $36,673. In view of our worldwide operations, certainly you will agree that this amount of cost depletion was negligible and hardly operated as an incentive for the "juggling of reserves computations" by Continental, as might be implied from Mr. Halverson's testimony. Furthermore, and even more important, the reserve figures used for these leases in our tax reports were our actual book reserves maintained by our company group responsible for our official corporate reserve figures.

We would like to be understood that our basic policy has been that of cooperation with the Commission when it has sought data from us. For example, we recently authorized the API to release to the FTC all raw data Continental had supplied the API for use in certain statistical reports on refinery capacity, throughputs, etc. However, when we are falsely accused in the press based on data supplied to the FTC under a confidentiality order, we are led to the conclusion that non-cooperation may be the more prudent approach.

We believe the whole idea of an FTC official going before Congressional committees with a disclaimer that the remarks he is about to make "are wholly my own and do not constitute an official statement for the Federal Trade Commission or any commissioner" is entirely inappropriate. You know as well as we that no high level official of a federal agency can seperate himself in such testimony from the agency he is employed by and that almost always whatever he says is attributed to the agency. We believe this practice should stop and call on you to take the necessary action to stop it within the Federal Trade Commission.

We also deplore the fact that Mr. Halverson would make sweeping conclusions of "serious underreporting" of gas reserves and charges of a "vehicle for a conspiracy," while otherwise admitting in his testimony that the documents "do not, of course, provide a complete picture" and that "no conclusive evidence has been found as yet of an actual conspiracy."

In this connection we believe a serious question is raised as to whether Mr. Halverson's testimony constitutes a violation of confidentiality imposed either by our agreement with the FTC, or by law. As you are aware, Section 10 of the Federal Trade Commission Act makes it unlawful for any officer or employee of the Commission to make public any information obtained by the Commission without its authority unless directed by a court. In light of the disclaimer by Mr. Halverson that the Commission has neither reviewed nor approved his testimony, we are constrained to inquire as to what authority Mr. Halverson had to disclose the information which he testified was received by him in the course of a pending investigation. This is doubly disturbing inasmuch as you introduced Mr. Halverson to the committee and invited the committee to direct any questions to him regarding the details of these investigations.

It is our belief that those who allege without proof that a natural gas shortage does not exist, and that shortages are the result of a conspiracy to drive up prices do a disservice to the nation. Such statements mislead, confuse and delay a public commitment to the positive programs so essential to adequate energy supplies. Facts leading to understanding, not bureaucratic and political rhetoric, are what this nation sorely needs at this critical point in its history.

Very truly yours,

By HOWARD W. BLAUVELT.

Exhibit 6.—Response of Chairman Engman to Response of Continental Oil Co. Response to testimony of James T. Halverson and Chairman Engman

FEDERAL TRADE COMMISSION,
Washington, D.C. August 29, 1973.

Hon. PHILIP A. HART,
Chairman, Antitrust and Monopoly Subcommittee, Senate Committee on the Judiciary, U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: On July 12, 1973, I received a letter from Howard W. Blauvelt, Executive Vice President of Continental Oil Company, concerning testimony given by Mr. James T. Halverson and me before the Senate Antitrust and Monopoly Subcommittee in June of this year.

Since, by separate correspondence to you, Mr. Blauvelt has requested that his correspondence be made a part of the record of the hearings, I have enclosed a copy of my response to Mr. Blauvelt.

In addition, on July 20, 1973, you transmitted to me a statement by Warren M. Sparks of Gulf Oil Corporation dated July 12, 1973, concerning the same testimony. This statement had been previously sent to me by Gulf Vice President Claude C. Wild, Jr., and I have enclosed a copy of my response to Mr. Wild.

Sincerely,

LEWIS A. ENGMAN.

AUGUST 29, 1973.

Mr. HOWARD W. BLAUVELT,
Executive Vice President, Continental Oil Company,
Stamford, Conn.

DEAR MR. BLAUVELT: This is in response to your letter of July 6, 1973, concerning the testimony given by Mr. James T. Halverson and me before the Senate Antitrust and Monopoly Subcommittee in June of this year. I have requested that Mr. Halverson respond to those aspects of your letter which take issue with statements and interpretations made by Mr. Halverson in the course of his testimony. I expect that you will be hearing from him in the near future.

I trust that you understand that Mr. Halverson and I testified at the specific request of the Subcommittee. Whenever such a request is made at a time when the Commission or its staff is examining the possibility of law enforcement activity, the Commission is faced with a dilemma in attempting to balance our obligation to Congress to respond to reasonable requests for information with our obligation to the public to enforce the antitrust laws vigorously and fairly. In this case, as in similar cases, I believe an effort was made to strike the best balance in the public interest.

I would also like to respond to two specific points raised in your letter. First you stated that you felt that the Commission practice of having FTC officials appear before congressional committees stating that their remarks are their own and not those of the Commission is entirely inappropriate. Let me make it clear that, in fact, Commission officials do often appear before congressional committees and present an official Commission position. However, there are other occasions when, because related matters are under investigation or in adjudication, it is felt desirable to have Commission staff personnel testify on behalf of the staff and not officially for the Commission. Testimony by staff introduced by such a disclaimer has been a common practice of virtually all independent federal regulatory agencies for many years. It is necessitated by the fact that while an agency's appointed Commissioners are the only persons with authority to issue or authorize official position statements, they must also function in an adjudicatory capacity. When specific cases come before the Commissioners for review following the rendering of initial decisions by Administrative Law Judges, they are required by law to consider the issues solely on the basis of the record, in an unbiased way. Staff members, by contrast, are under no such constraints.

Any requirement that an official Commission position be propounded before a congressional committee on any matter under investigation by or in adjudication before the Commission could have one of two undesirable results. If the official position set forth stated or even suggested conclusions concerning specific facts, the Commission could be faced with the charge that it had prejudged those issues and should therefore be disqualified to hear a case involving those issues. The same problem faces an individual Commission who propounds his position on specific facts at issue. The threat of disqualification can arise because of questions posed or comments made to a Commissioner by the members of the Congressional commmittee, and this is an additional reason why it is desirable for staff personnel to testify on their own when the subject matter of the congressional inquiry involves a matter before the Commission. If staff members could not testify on their own, the alternative to running the risk of disqualification would be no testimony at all on matters under investigation or in adjudication before the Commission. The first alternative would severely cripple the Commission's system of administrative justice while the matter would deprive Congress of needed expertise on proposed legislation. On balance, therefore, we believe the public policy requires the continuation of our present procedures.

I trust that you will understand that Mr. Halverson's disclaimer was not intended to indicate that he was testifying in the capacity of a private individual. Rather he was speaking officially as a knowledgeable and responsible member of the Commission's staff, and on behalf of the Bureau of Competition.

Secondly, you stated that you felt a serious question was raised as to whether Mr. Halverson's testimony constituted a violation of confidentiality imposed either by Continental Oil's agreement with the Federal Trade Commission or by Section 10 of the Federal Trade Commission Act. I wish to emphasize that in his statements and responses before the Subcommittee, Mr. Halverson was careful not to disclose any specific data of any particular company which could be construed to be in contravention of any agreements of confidentiality or of Section 10 of the Federal Trade Commission Act. Moreover, although the Commission did not review or approve Mr. Halverson's specific testimony, an informational copy of his prepared statement was furnished to each Commissioner in advance of Mr. Halverson's appearance before the Subcommittee and he appeared with full knowledge of the Commission.

Sincerely,

LEWIS A. ENGMAN,
Chairman.

Exhibit 7.—Response of James T. Halverson to Continental Oil Co. letter of July 6, 1973

FEDERAL TRADE COMMISSION,
BUREAU OF COMPETITION,
Washington, D.C., February 1, 1974.

HOWARD W. BLAUVELT,
Executive Vice President, Continental Oil Co.,
Stamford, Conn.

DEAR MR. BLAUVELT: Chairman Engman has asked me to respond to your letter of July 6, 1973, concerning your objections to my testimony of June 27, 1973, before the Senate Antitrust and Monopoly Subcommittee. In responding to you, I am requesting that Senator Hart make a copy of this letter a part of the record of the Subcommittee's hearings into competition in the energy industry. I note that this response reflects my own personal views and does not constitute an official statement by the Federal Trade Commission.

So that you have a greater understanding of the genesis of my decision to testify before the Subcommittee, you should be advised that Chairman Engman received a letter from Senator Hart on June 5, 1973, requesting a detailed report together with "preliminary conclusions" on all Commission investigations relative to energy including an investigation, styled In the Matter of the American Gas Association et al., File No. 711 0042, which relates to the reporting of natural gas reserves. I am enclosing a copy of Senator Hart's letter. Mindful of the need for information to evaluate legislative proposals under consideration, Chairman Engman directed me and I directed members of the Bureau of Competition to prepare a report as requested by Senator Hart. This staff response was transmitted to the Subcommittee on June 19, 1973.

Senator Hart also requested that Chairman Engman, I and certain staff members appear on June 27 before the Subcommittee to testify and answer questions regarding pending Commission energy investigations. In preparing the June 19 Staff Memorandum, and in the preparation of my testimony, scrupulous care was taken to avoid any disclosure of information protected by either the Commission's Rules of Practice or by the "Commitment of Confidentiality" extended by the Commission to any company in connection with File No. 711 0042.

Near the beginning of your letter, you state that I have assumed that "estimating hydrocarbon reserves is an exact science" and that when your employees evaluate the amount of hydrocarbons deep within the earth, their opinions frequently differ. Please be assured that I and staff members of the Bureau of Competition are and have been fully aware of the many variables and difficulties which prevail in hydrocarbon reserve estimation and of the fact that professional opinions in this regard can and do differ to some extent.

At the time of my appearance before the Subcommittee, documents submitted by two producers had already been examined in detail. This examination revealed that evaluations of proved reserves transmitted by producers to the ACA were not higher but often significantly lower than the producers' own in-house evaluations. This pattern defied the random differentials that can be expected when comparing the work of one individual with that of another. Indeed, this examination disclosed that some of the low AGA estimates were prepared by the same individual who prepared the higher in-house estimates.

Your letter further states that Continental Oil's "booked reserves" for South Louisiana and the proved reserves that it has reported for this area to the AGA have been identical since 1969. At this point in time we are not in a position to agree or disagree with this assertion because our staff has not completed a full review of the documents which your company has submitted. Our staff has had to concentrate during the past several months on the Commission's subpoena enforcement actions against several of the natural gas producers. Therefore, a complete review of Continental's documents has been held in abeyance although it is expected to be completed shortly. You will recall that in the course of my prepared remarks. I made no direct reference to Continental Oil's reporting of proved reserves and specifically stated (Transcript, p. 230)

> ". . . the staff is reviewing approximately 36,000 documents produced by one company in partial compliance with the subpoena. A return hearing is set for July 31, and August 1 . . ."

Although "Continental Oil" was not specifically mentioned in the above quotation, it is obvious that I was referring to your company because as you or your staff know, Continental Oil had returned approximately 36,000 documents and at the time of my statement Continental Oil employees were scheduled to be questioned on July 31 and August 1. The above quotation further indicates that the documents were in the process of being reviewed, i.e., that review was not complete. The June 19 Staff Memorandum (p. 12) to the Subcommittee expressly states this:

> "[Continental Oil's] documents have not as yet been completely examined and the return hearing is scheduled for July 31 and August 1, 1973."

Accordingly, your company's documents did not at the time of my testimony constitute a basis for my statement concerning low reporting of proved reserves to the AGA.

However, notwithstanding the express language of my prepared statement and the June 19 Staff Memorandum, referred to above, my reading of the rough transcript of the question and answer session following my proposed remarks indicates that on two occasions I referred to information obtained from "three companies" in a context which could fairly be construed to indicate that information from *each and all three* companies formed the basis for my statement concerning low reporting of proved reserves to the AGA. Let me assure you that since we had not fully reviewed Continental's documents at the time, it certainly was not my intention to convey the impression that information from Continental in addiiton to the other two companies formed he basis for my aforesaid satement. Recognizing, however, that the matter should be clarified, I have requested the Subcommittee to amend the record so that the official transcript of my two referenced responses will be read as follows (brackets refer to deletions and *italics* refers to additions):

> "Senator Hart. Thank you.
>
> There are questions, but as I understand your testimony, what you are telling us is that the gas reserve information which the FPC has obtained is basically worthless for determining whether there is a natural gas shortage. Is that a fair conclusion that I have arrived at?
>
> Mr. Halverson. [I think I am saying] *On* [on] the basis of the information *which* we have [from three companies to] *completely reviewed as of this* date, it appears to me here has been a substantial under-reporting of gas reserves, when *we* [I] compare in-house *data* with the data compiled by the AGA." (Transcript, p. 239)

* * *

> "Mr. Chumbris. Where are you getting your data from?
>
> Mr. Halverson. Submissions by three companies, *one of which we have not yet completely reviewed* [themselves.]. In-house data. In South Louisiana, we had 11 *subpoenas*. The rest of the companies have not complied with our subpoenas." (Transcript, p. 242)

In addition, you will note that a copy of this letter is being sent to Senator Hart for insertion in the record.

Regarding the comment on page 2 of your letter concerning the fact that "dissolved" gas estimates were not included in reserve estimates furnished by Mr. Kerr to the AGA, please be advisd that staff when comparing total proved reserves has from the very outset and will continue to add API estimates of dissolved gas to AGA field by field estimates so that accurate comparisons can be made.

At pages two and three of your letter you comment on the value of certain in-house reserve estimates. When you state that reserve figures made when determining whether to build drilling platforms are estimated "on an optimistic basis," I assume that you mean that such estimates encompass both potential (probable or possible) and proved reserves. If this is your meaning, then permit me to assure you that staff, in comparing these estimates with any other estimates of proved reserves, did not include potential reserves in its comparisons. If, however, by "optimistic basis" you mean that proved reserves (not including potential reserves) estimated in determining whether to build platforms are usually overstated, then I disagree. I would find it surprising if conscientious professionals in your company would deliberately overstate their estimates when to do so would be to jeopardize millions of dollars of investments. Furthermore, I understand that precisely the same standards govern the estimating of proved reserves, irrespective of the situations for which the estimates are made.

Likewise, you indicate that in most cases exploratory reserve computations tend toward the optimistic. My response to this is the same as I made with regard to reserve computations in determining whether to build platforms. Thus, staff did not include potential reserves when comparing proved reserves. Further, for the very reasons stated in connection with computations made prior to the building of platforms, there are no grounds for believing that exploratory reserve computations, as regards the proved reserves complement, tend toward overstatement.

In my remarks before the Senate Antitrust and Monopoly Subcommittee, I pointed out that book reserves tend to be conservative. One reason for this is that they may be used for tax purposes. Low reserve estimates can serve to increase depreciation allowances for tangible physical assets and serve to increase cost depletion allowances. Such increased allowances lower federal income tax liability. Thus to fail to state book reserves conservatively could be to invite higher federal income taxes.

You seek to minimize this principle as applied to Continental Oil by stating that Continental Oil resorts principally to percentage depletion and that reserve estimates are irrelevant in computing these allowances. You do acknowledge, however, that Continental Oil does use book reserves in connection with cost depletion: that it does cost deplete on occasion: and you neglect to respond to the fact that book reserves are an important factor in computing depreciation allowances on tangible physical assets for tax purposes. It seems apparent that the extent to which Continental Oil may realize tax savings from utilization of book reserves in computing depreciation allowances would have an important bearing on this point.

On page 4 of your letter you question a practice of Commission staff members to preface their testimony before Congressional Committees with a disclaimer to the effect that they are not speaking for the Commission or any individual Commissioner, and you express dissatisfaction with my statement that "my remarks are wholly my own and do not constitute an official statement for the Federal Trade Commission or any Commissioner" (Transcript p. 223). You also raise the possibility that I may have transgressed either Section 10 of the Federal Trade Commission Act or the "Commitment of Confidentiality" extended by the Commission in this matter. Because Chairman Engman, by his letter to you dated August 29, 1973, has responded to you with regard to these matters, it is unnecessary for me to comment further, except that I shall append a copy of his letter to this letter.

In conclusion, I entirely agree with you that positive programs with regard to energy supplies are needed. I submit that this Bureau's investigation into whether AGA statistics are deliberately or otherwise under-reported is such a positive program. Continental Oil's cooperation in submitting documents pursuant to this investigation is an important contribution to this program. I trust that Continental Oil will see fit to submit voluntarily the relatively few remaining documents called for by the Commission subpoena issued to it.

Very truly yours,

James T. Halverson,
Director, Bureau of Competition.

Enclosures.

Exhibit 8.—Response to Continental Oil Co. to letter of James T. Halverson Dated February 1, 1974

CONTINENTAL OIL CO.,
Stamford, Conn., February 19, 1974.

Mr. JAMES T. HALVERSON,
Director, Bureau of Competition,
Federal Trade Commission,
Washington, D.C.

DEAR MR. HALVERSON: Your February 1, 1974 reply to my letter of July 6, 1973, was received on February 5, 1974. I note that it has taken you virtually seven months to make your response.

Your acknowledgment that on two occasions you referred to information obtained from three companies in a context which could fairly be construed to indicate that information from each and all three companies formed the basis for your statement concerning low reporting of proved reserves to the AGA is a constructive step forward. However, that acknowledgment and the technical corrections to the record of the Senate Subcommittee at this late date can hardly repair the damage to the reputation of our Company caused by the news media reports of your comments at the time they were made. This acknowledgment would have been more useful had it been promptly made and reported in the news media.

The references to reserves in your letter merely serve to verify my impression that you do not yet understand the difference between reserves calculated on an historical basis with respect to existing fields and reserves calculated on a purely speculative basis before committing capital investments and exploration expenses. which it is hoped in the future will result in finding and developing hydrocarbon reserves. The one is determined by well established reservoir engineering methods based on large amounts of data. The other is speculation from geological and geophysical data and can only be proven or disproven by drilling holes in the ground.

On page six of your letter, you state ". . . you neglect to respond to the fact that book reserves are an important factor in computing depreciation allowances on tangible physical assets for tax purposes. It seems apparent that the extent to which Continental Oil Company may realize tax savings from utilization of book reserves in computing depreciation allowances would have an important bearing on this point." You are completely in error. Continental Oil Company does not use the unit of production method in calculating depreciation deductions for tax purposes. The relevant assets are depreciated strictly on a time basis over their useful lives.

In your concluding paragraph, you state, "I trust that Continental Oil will see fit to submit voluntarily the relatively few remaining documents called for by the Commission subpoena issued to it." You are again in error, as we will not submit the requested documents unless required by proper judicial procedures to do so. You are already well aware of one of the reasons, which is that the requested information is of competitive value, and it would be damaging to our stockholders to submit it. The second reason is that the improprieties already evidenced by you in handling the information that we did submit voluntarily give us no comfort whatever that you will not continue to repeat the procedure.

You indicate in your letter that a copy of it is being sent to Senator Hart for insertion in the record. I also note that you have not requested that my letter of July 6, 1973, be inserted in the record nor, as far as I know, has that action with respect to it been taken. *Neither do I expect that you nor anyone else will see that this current letter is inserted in the record.* I suggest to you that if you wish to make a record you should make a full and complete record so that interested parties can have all that is available to them and not merely your version of it.

Very truly yours.

HOWARD W. BLAUVELT,
Executive Vice President.

Exhibit 9.—Information Requested During Testimony of Chairman Engman and Mr. Halverson

FEDERAL TRADE COMMISSION,
Washington, D.C., September 14, 1973.

Hon. PHILIP A. HART,
Chairman, Subcommittee on Antitrust and Monopoly, Committee on the Judiciary, U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: This will provide part of the supplemental information requested at the June 27, 1973, hearing on energy studies before your Subcommittee.

Four items were requested during the course of the hearing in order to supplement the testimony of Chairman Lewis A. Engman and Mr. James T. Halverson. The first three requests, involving the Federal Trade Commission's investigation *In the Matter of the American Gas Association*, File No. 711 0042, were for information on:

(1) The events between October 20, 1970, and June 3, 1971 (T. 217);

(2) Whether any Federal Power Commission personnel sought to curtail or close the investigation (T. 217); and

(3) The oral communications between the Federal Trade Commission and the Federal Power Commission (T. 247).

The fourth request involves another Federal Trade Commission investigation styled, "Crash Parts," File No. 721 0053. This request is for information on the current status of the "crash parts" investigation (T. 219). A response to this request will be forthcoming shortly under separate cover.

I. EVENTS BETWEEN OCTOBER 20, 1970, AND JUNE 3, 1971

The Commission by minute dated October 20, 1970, directed the staff to commence an investigation into the reporting, estimation and deployment of reserves by the natural gas industry. On October 26, 1970, Justice Department clearance was obtained and on November 4, 1970, an investigation was initiated to determine whether there was reason to believe that American Gas Association and others had engaged or were engaging in collusive action in the solicitation and reporting of information pertaining to reserves in violation of Section 5 of the Federal Trade Commission Act. On November 6, 1970, Attorneys Anthony DePhillips, William T. Diener, and Brockman Horne were assigned to the case with Mr. DePhillips having the primary responsibility and reporting to Assistant Director Owen Johnson.

On December 24, 1970, a letter was directed to Mr. John C. Jacobs, Jr., Chairman of the AGA Committee on Natural Gas Reserves requesting detailed information concerning the operation and procedures of the South Louisiana Subcommittee on Natural Gas Reserves. Partial responses were received to this letter. In addition to these responses, the staff gained information through interviews of numerous personnel, including people from National Economic Research Associates, Inc., United States Geological Survey, the Federal Power Commission and the Antitrust and Monopoly Subcommittee.

Based on evidence gathered from these sources, one of the attorneys assigned to the case, Mr. William T. Diener, recommended that the case be closed for lack of evidence of collusion among members of the AGA South Louisiana area Subcommittee. This recommendation, contained in an undated memorandum prepared sometime between December 25, 1970, and April 11, 1971, was submitted to Owen Johnson, Assistant Director, Bureau of Competition. This memorandum clearly stated that it was only the author's personal belief that the file should be closed. No action was taken by the Assistant Director on this recommendation.

On March 16, 1971, Mr. DePhillips and Mr. Diener requested the Commission to authorize the use of compulsory process. On April 8, 1971, the Bureau of Competition was directed by the Commission to advise the Commission as to whether the information to be developed pursuant to the use of compulsory process was necessary to the public interest and whether the individuals who might be subpoenaed were likely to refuse to testify or to provide information on the basis of their privilege against self-incrimination. The Commission was concerned whether the issuance of subpoenas would inadvertantly result in the granting of immunity under Section 6004 of the Organized Crime Control Act.

On April 9, 1971, Mr. William Diener resigned from the Federal Trade Commission and joined the staff of the Federal Power Commission. On April 20, 1971, Attorneys DePhillips and Horne submitted a memorandum to the Commission advising the Commission that the information to be develop through the use of compulsory process was necessary to the public interest and also advising the Commission that they had no information that any of the officials of the companies named in the resolution for compulsory process would be likely to refuse to testify or provide information on the basis of the privilege against self-incrimination. On April 26, 1971, the General Counsel submitted a memorandum to the Commission in which, after considering the possibility of immunity being granted inadvertently and deciding that it was not a problem in this case. he recommended approval of the resolution authorizing the use of compulsory process.

On May 4, 1971, a Commission minute reflects that the resolutions submitted by the Bureau of Competition with a memorandum of March 16. 1971, were approved. This approval was, however, subject to the Chairman's report to the Commission on the Chairman of the Federal Power Commission's thoughts as to the use of compulsory process. On May 11, 1971, a Commission minute indicates that the Chairman of the Federal Power Commission expressed no objection to the Federal Trade Commission's proceeding by way of compulsory process. This minute, therefore, affirmed the Commission's action on May 4, 1971. On May 21, 1971, Attorneys DePhillips and Horne requested approval of a resolution broadening the previously approved resolution. On June 3, 1971, the Commission approved the amended resolution.

II. WHETHER ANY FEDERAL POWER COMMISSION PERSONNEL SOUGHT TO CURTAIL OR CLOSE THE INVESTIGATION

The Commission is unaware of any attempt by the Federal Power Commission to close its investigation. Material relating to cooperation of Federal Power Commission personnel has been previously submitted to this Subcommittee.

III. THE ORAL COMMUNICATIONS BETWEEN THE FEDERAL TRADE COMMISSION AND THE FEDERAL POWER COMMISSION

Various oral communications with the Federal Power Commission are documented in information already submitted to the Subcommittee. This information includes the June 1973 Staff Report, the various memoranda and interview reports submitted to the Subcommittee, and the testimony of Mr. Halverson. Other than the oral communications reflected in the above, the staff advises that it has had no significant oral communications with the Federal Power Commission regarding this matter.

By direction of the Commission.

Charles A. Tobin,
Secretary.

Exhibit 10.—Response of William E. Simon to the Testimony of James Halverson

Hon. Lewis A. Engman,
Chairman, FTC,
Washington, D.C.

Dear Mr. Chairman: I have read with concern the statements by James Halverson, Director of the Bureau of Competition, before the Senate Judiicary Committee and the Senate Committee on Commerce, in which he discusses the structure of the petroleum industry. I understand that in the subsequent questioning, Mr. Halverson suggested the breakup of integrated oil companies by divestiture of refining or producing operations from marketing. This proposal gives me a great deal of concern because of its implications for domestic energy supply in the next few years.

In the first place, I find it difficult to accept the concept that the petroleum industry is not competitive. While Mr. Halverson singles out eight major oil companies, there are, as you know, at least fifteen to twenty other very large oil companies with integrated operations in addition to the hundreds of independents who do not have integrated operations or are partially integrated.

The so-called "independent" operations sprang up in the last twenty years principally because of surplus crude and refining capacity. The independents bought marginal stocks at relatively low prices. They were able to charge low prices because of this and also because they did not have to incur the substantial capital investment needed by the major oil companies.

This surplus capacity is now gone and with it the primary source of independent's position in the industry. Far from being a result of deliberate anticompetitive actions by the integrated oil companies, it seems to me to be the result of the inability of domestic supply to keep up with demand. This in turn has been a result of many factors, especially past public policies that have discouraged new refinery construction and exploration and drilling.

Since the President's Energy Message on April 18, a number of companies, independents and majors, have announced plans to build new refineries or expand existing refineries for a total new capacity of nearly 2.5 million barrels per day. Some of these companies are now having second thoughts. Besides causing critically needed refinery expansion plans to be delayed or cancelled, the possible divestiture of refineries from integrated oil companies is making it difficult for several independent marketers who have announced plans to build refineries to carry through their plans. Statements by FTC Staff are, ironically, contributing to the difficulties of the independent segment of the industry.

We are, as I am sure you are aware, in the midst of a national energy crisis. We simply do not have sufficient refining capacity to produce the gasoline and heating oil that we are going to need in the next decade. We will have to build the equivalent of 60 new refineries in the next 12 years at a cost of about $250 million each, for a total of $15 billion. Thus far, refinery construction has been stalled, in part, because of inadequate financial incentives and active opposition of environmentalists to new refinery sitings. We must also accelerate drilling for oil, primarily on the Outer Continental Shelf. Drilling on most parts of the OCS is expensive and outside the financial capabilities of the nonintegrated independent oil companies.

As Chairman of the Oil Policy Committee, I would like to meet with you to discuss this matter further and also provide you with our complete comments on the FTC staff recommendations before final Commission action.

Sincerely yours,

William E. Simon.

Exhibit 11.—Response of Robert E. Lewis, FTC, to Letter to Chairman Engman from William E. Simon, re testimony of James Halverson

Federal Trade Commission,
Office of the Chairman,
Washington, D.C., August 10, 1973.

Hon. William E. Simon,
The Deputy Secretary of the Treasury, the Department of the Treasury, Washington, D.C.

Dear Mr. Simon: This will acknowledge your letter of July 30, 1973, to Chairman Engman concerning the statements made by James Halverson, Director, Bureau of Competition, before the Senate Judiciary Committee and Senate Commerce Committee regarding the petroleum industry.

The Commission, on July 17, 1973, issued a formal antitrust complaint against eight major petroleum companies. Now that this matter has progressed from the investigative to the adjudicatory phase, any discussion by any Commissioner of the complaint or its underlying legal or factual bases could give rise to charges of impropriety or unfairness or the appearance thereof. The issues which you raise regarding competition in the petroleum industry and the appropriateness of certain relief are questions basic to the action presently being prosecuted by Commission staff.

Therefore, since it would not be appropriate for the Chairman in his judicial capacity to discuss the specific issues which you have raised, I have forwarded your letter to Mr. Halverson for further response. I have also forwarded a copy of your letter to the Secretary to be placed upon the public record and to be forwarded to the parties in the proceeding pursuant to our Rules of Practice and Procedure (16 C.F.R. § 4.7) and Commission policy concerning communications received by Commissioners while matters are in litigation.

If you have any further questions concerning this matter, please contact our General Counsel, Calvin J. Collier.

Sincerely,

Robert J. Lewis,
Assistant to the Chairman.

Exhibit 12.—Response of Frank C. Allen to Testimony of James Halverson

FEDERAL POWER COMMISSION,
Washington, D.C., July 27, 1973.

Hon. PHILIP A. HART,
U.S. Senate,
Washington, D.C.

DEAR SENATOR HART: With your permission I should like to submit the following comments in order to minimize any misunderstanding which may arise as a result of the testimony of James Halverson, Director, Bureau of Competition, Federal Trade Commission, before the Senate Subcommittee on Antitrust and Monopoly of the Committee on the Judiciary, 93rd Congress, 2nd Session on June 27, 1973.

So that the record may be complete, the Subcommittee should be informed that the use of American Gas Association (A.G.A.) data in area rate proceedings before the Federal Power Commission is limited and remains today the same as it was in the Commission's first area rate proceeding involving the Permian Basin Area decided in 1965. Reserve data prepared by A.G.A. was not then and is not now used by the Commission in making its cost calculations involved in the flowing gas rate. The costs supporting the flowing gas rate are related to actual volumes of production, not reserves.

The use of A.G.A. reserve data by the Commission in ratemaking is typified in the most recent Southern Louisiana decision, Opinion No. 598 and 598–A, affirmed by the United States Court of Appeals for the Fifth Circuit, *sub nom* Placid Oil Co v. F.P.C., —— F. 2d —— (CA5 1973). There A.G.A. reserve data is used in costing "new gas" under contracts dated on or after October 1, 1968, under a formula adopted by the Commission in 1965 in its Permian Basin decision which was approved by the Supreme Court in 1968 as within the Commission's discretion. That formula seeks to derive a unit cost for finding and producing each Mcf of new gas by dividing nation-wide average annual gross reserve additions into nationwide costs of finding and producing gas. Specifically, productivity is computed by relating A.G.A. reported reserve additions of non-associated gas to gas well footage drilled. The Federal Power Commission considered the arguments raised by some parties concerning the use of A.G.A. data in costing of new gas in the Southern Louisiana Area Rate decision and concluded that if all arguments concerning the use of A.G.A. data by those parties were accepted as valid that the effect of new gas costs would be less than 1 cent per Mcf. (Opinion No. 598–A, page 8). For the reason indicated above there would be no effect on flowing gas rates. In City of Chicago v. F.P.C., 458 F. 2d 731 (CADC 1971), the court commented on the use of extra record evidence consisting, in part, of AG.A. data, stating at p. 747:

"Interpretation of, and assignment of weight to, data such as these is a task which particularly calls for expert judgment. In interpreting such data and in making predictions based on them, the Commission must be expected to make use of the experience it has gained through years of dealing with the problem of the supply of natural gas."

In response to questioning by Mr. Bangert, Mr. Halverson responded in a manner which could lead to the erroneous impression that the Federal Power Commission has denied certain Form 15 data to the Federal Trade Commission (TR 244–246). Chairman Nassikas, responding to questioning by Senator Kennedy, indicated that the Federal Power Commission's cooperation with the Federal Trade Commission was documented in a hearing before the Senate Committee on Commerce (TR 153–154). However, since the testimony of Chairman Nassikas was given before that of the Federal Trade Commission, no opportunity to respond to specific points raised by Mr. Halverson has been afforded. In reading the testimony of Mr. Halverson, it is possible for one to conclude that the Federal Power Commission had failed to provide data, or access to data, reported in Form 15 to the Federal Trade Commission. Your Subcommittee should be advised that copies of Form 15 (reported by each pipeline) are kept on open shelves in the Office of Public Information and are available during normal business hours for inspection and reproduction by the public at large. Commercial Xerox machines are available for immediate use at a charge of ten cents per copy. In addition, the Office of Public Information provides a service to the public whereby material may be reproduced at eight cents per copy. This service, however, requires approximately one week to process.

The $25,000 figure alluded to by Mr. Bangert is the estimated cost of certain manual processing of portions of Form 15 data as requested by the Federal Trade Commission. At transcript page 245 Mr. Bangert propounds the following question to Mr. Halverson:

"The Federal Trade Commission wanted information from pipeline firms which the Federal Power Commission had and they were told that would cost them $25,000 to get that, and as I understand it then you did go and get the same information from another source, presumably at a bargain price?"

First, it should be noted that the requests for this information was from certain members of the Staff of the Federal Trade Commission to Staff members of the Federal Power Commission, At no time was a request from the Chairman or Commissioners of the Federal Trade Commission received. In response Mr. Halverson does not comment on the reasonableness of the estimated cost of producing the calculations requested. Instead, he indicates that this and other information is being sought by issuing subpoenas to some of the producers. At the time the calculations from Form 15 were requested our best estimate of the cost of performing such calculations was $25,000. I now reaffirm that the cost to the Federal Power Commission to provide the information requested is not less than $25,000. Furthermore, the fact that the Federal Trade Commission, exercising its subpoena power, may shift the cost of providing such information from the Federal Power Commission to affected companies in no way discredits our estimated cost, and in no way indicates any unwillingness on our part to cooperate fully with the Federal Trade Commission or its Staff.

I would appreciate your including this letter in the record of this hearing. Like Mr. Halverson, I express my personal views only and this does not constitute an official statement of this Commission.

Respectfully submitted.

Frank C. Allen,
Acting Deputy Chief, Bureau of Natural Gas.

Exhibit 13.—Response of James T. Halverson to Letter of Frank C. Allen re Testimony of Mr. Halverson

Federal Trade Commission,
Bureau of Competition,
Washington, D.C., February 1, 1974.

Frank C. Allen,
Acting Deputy Chief, Bureau of Natural Gas, Federal Power Commission, Washington, D.C.

Dear Mr. Allen: This will acknowledge receipt of and respond to a copy of your letter to Senator Hart dated July 27, 1973, in which you comment on remarks made by me on June 7, 1973, before the Senate Subcommittee on Antitrust and Monopoly. In replying to you, I am requesting that Senator Hart make a copy of this letter a part of the record of the Subcommittee's hearings into competition in the energy industry. This response reflects personal views; it does not constitute an official statement by the Federal Trade Commission.

A cursory reading of your letter might lead the reader to conclude that reserve data prepared by the American Gas Association (AGA) is used in FPC area rate proceedings solely "in costing 'new gas'." As you know, the FPC approved overall rates (including "flowing gas" rates) for the South Louisiana Area only after an intensive review of the adequacy of the supply of natural gas. It was strongly urged to undertake this review by the Fifth Circuit Court of Appeals—see *Southern Louisiana Area Rates case* v. *FPC*, 428 F.2d 407, at 439, 440—referred to hereinafter as the *Austral* case. That the FPC heeded this directive is apparent from its Opinion (at page 6, slip opinion) in AR69–1, the South Louisiana rate decision: "Our duty is to reverse a downward trend of the exploration and development effort, thereby to increase the likelihood of augmenting the national inventory of proved reserves of natural gas."

At pages 19–31 (slip opinion, AR69–1), the FPC considered the evidence relating to gas supply. At page 30, the Power Commission stated, "The evidentiary fact which most concerns us is not in dispute: the traditional trend lines for measuring adequacy of supply, namely, reserves to production (R/P) and findings [of reserves] to production (F/P) ratios, are in a declining mode." As the charts on pages 28 and 29 of the opinion indicate, R/P ratios are determined by dividing reserve figures derived from Form 15s and from the AGA by production figures.[1] However, as the FPC indicates, at page 27, Form data represents over 70% of domestic proved reserves . . ." Thus, the only truly national figures for determining the evidentiary fact of most concern to the FPC were admittedly AGA figures.

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[1] While the charts do not disclose this, the F/P ratios are determined in the same manner.

As regards reliance on these figures in this context, the FPC stated the following at page 21:

> The Committee on Natural Gas Reserves of the American Gas Association compiles estimates of reserves which are published in an annual report entitled "Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas in the United States and Canada." This report has been published annually since 1945 and has been extensively relied upon by the industry, the government, banks, and other financial institutions, *and this Commission.* (emphasis added)

The FPC staff (see page 7 of Initial Staff Brief in AR69-1) was equally candid:

> The most critical issue in these proceedings is that of the adequacy of gas supply and the related issue of the adequacy of service to consumers. There is at the present time an acute shortage of natural gas in the field available to interstate markets . . . Clear evidence of the deteriorating gas supply situation came with publication of the American Gas Association's report on gas reserves for year 1968. This report published in May 1969 showed that the new supply gas brought forth by the industry during 1968 was only 12 Tcf [trillion cubic feet], or about 62 percent of 1968 production . . . This situation was repeated in 1969, when reserve additions amounted to only 8.3 Tfc as compared with production of 20.6 Tcf . . . This trend continued in 1970. Preliminary AGA figures for 1970 indicated. . . .

Thus, AGA figures were relied upon by the FPC in determining the critical issue of whether a supply problem existed requiring a general increase in area rates. Having concluded that such a supply problem did exist, the FPC subsequently turned to costing.

You note that AGA reserve data is not used in costing "flowing gas".[2] While such data is not used as a part of the costing formula, your statement overlooks the fact that the FPC's determination of a supply problem played a direct role in the costing of "flowing gas" rates in South Louisiana.

Before the FPC rendered its decision in AR69-1, it was cautioned by the *Austral* court:

> We think our opinion, and indeed probably the circumstances themselves, will notify the Commission that it cannot in the future set prices by cost considerations in a vacuum.[3]
>
> * * * if the supply is not too plentiful and the price is not sufficient incentive to exploit it and fails to bring forth the quantity needed the price is unwisely low, even if it does not square perfectly with somebody's idea of return on a "rate base" [footnote omitted] [4]

The following excerpts from paragraphs 151, 155 and 156 of AR69-1 disclose that the admonitions of the court were heeded by the FPC, thereby indicating that fear of supply shortages, based as we have seen in part on AGA statistics, played a direct role in the costing of "flowing gas":

> 151. So the significant argument is whether flowing gas realizations should bear a part of the responsibility for assuring a cash flow to meet the needs for a heightened exploration and production effort. We believe they should.
>
> 155. By recommending a flowing gas price higher than that arrived at in Opinion No. 546, using the same methodology (except for the substitution of the direct assignment method for calculating exploration and development costs), and then further recommending acceptance of the settlement at a still higher level, again without change in methodology or adjustment of any of the computations, *Staff was candidly and correctly making the flowing gas cost bear a part of the responsibility for further exploration*—in other words, it was looking to the total rate design. (emphasis added)
>
> 156. * * * We find it unlikely that producers, already involved in the Southern Louisiana area, will decide not to expand their exploratory and drilling effort. Moreover, the incentives we establish herein, for flowing gas rates, are designed to elicit an industry response of dedications of new gas reserves to the jurisdictional market.

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[2] "Flowing gas" as concerns South Louisiana is gas which was contracted for (for subsequent delivery to interstate pipelines) prior to October 1, 1968.

[3] 428 F. 2d 407, at 439.

[4] Id, at 443.

As you point out near the beginning of your letter, AGA statistics are used in costing "new gas." [5] The following language in the Initial [FPC] Staff Brief in AR69–1, at pages 61–62, indicates the precise role assigned to AGA figures in determining this costing:

> The American Gas Association's Committee on Natural Gas Reserves reports annually certain reserves and production statistics for the natural gas industry in the United States. These annual reports show, *inter alia*, the volumes of gas reserves which were found or added during the report year in four categories designated extensions, revisions, new fields, and new reservoirs. [footnote omitted] The total of reserves reported in these four categories is sometimes referred to as "gross additions," "new supply," "*reserves added*," (emphasis added) or simply "findings." The AGA gas reserves data are relied on extensively in evaluating trends in gas supply and demand. [citations omitted] Pursuant to the methods and procedures established by the Commission they are also used in determining the cost of finding gas.
>
> In determining the current finding cost of non-associated gas, average annual expenditures made in the search for non-associated gas are spread over the average volume of nonassociated *gas reserves added* (emphasis added) as reported by the AGA. The cost result is stated in cents per Mcf of reserves added. AGA reserves thus constitute the denominator of the costing ratio. All current cost estimates submitted in these proceedings rely on the annual AGA reports for necessary gas reserves information.

Your principal point with regard to the use of AGA figures in AR69–1 for costing "new gas" appears to be that if all criticisms of the AGA figures were accepted as valid, that nevertheless, "the effect of new gas costs would be less than 1 cent per Mcf." It is true that the FPC, in Opinion 598–A, considered eliminating 1969 AGA data altogether, and concluded (at page 8) that if it did so "the productivity factor in the costing of new gas would net a result of less than 1 cent, well within the 4–5 cents per Mcf zone of reasonable costs." However, the FPC then went on to state "if we were to assume that AGA reserve additions were under-estimated, we could add the ten trillion cubic feet purported discrepancy—or even double that figure—and the result would still be well within the zone of reasonable costs." [6]

First, it is noted that if two cents per Mcf were tacked on to all "gas reserves added" in 1970, as these were reported by the AGA, the market value of these reserves would be increased by $734,927,180. More to the point, it is quite possible that South Louisiana "gas reserves added" were under-reported in both 1968 and 1969, and by a margin exceeding the 10–20 Tcf assumed by the FPC. Further, it is also quite possible that such under-reporting occurred in other producing areas as well. The AGA admission that it under-reported Alaskan gas by 26 Tcf in 1968,[7] together with the sizable differences in new field discoveries reported in 1968 and 1969 by the American Association of Petroleum Geologists as against the AGA,[8] lend credence to this possibility. Thus, even if the use of AGA figures in AR69–1 had been limited to the costing of "new gas" (and of course this was not the case), any assumption that the maximum under-reporting by AGA in 1968 and 1969 was in the 10–20 Tcf range and hence could not affect costing by more than 1–2 cents per Mcf appears to be highly unwarranted.

The balance of your letter deals with cooperation between our agencies and specifically with whether it can be concluded from my remarks (Tr. 244–45) that the FPC refused FTC staff access to certain Form 15 data that is on computer tape. Inasmuch as I specifically stated that the FPC offered such data to our staff at a charge of $25,000, I do not believe that my remarks are susceptible to the interpretation that you suggest. While I do not comprehend the relevance of your statement that the request was by FTC staff and not by its Commissioners, I accept without reservation your statement that the cost to the FPC of furnishing the data would be no less than $25,000.

Very truly yours,

JAMES T. HALVERSON,
Director, Bureau of Competition.

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[5] "New gas" as concerns South Louisiana is gas which was contracted for on or after October 1, 1968, for delivery to interstate pipelines.

[6] Assuming an additional 20 trillion cubic feet in reserve additions from 1946–1967, the result, 658 Mcf, would affect new gas costs about two cents per Mcf.

[7] While this under-reporting was of associated gas and hence irrelevant to the costing formula for non-associated gas, it goes to the accuracy of AGA reporting and is directly relevant to the critical issue of adequacy of supply.

[8] The AAPG reported new field discoveries for 1968 of 6 Tcf against the 1.4 Tcf reported by the AFA and in 1969 reported 4.5 Tcf against the AGA's 1.7 Tcf.

Senator HART. Our next witness is Dr. Mann, director, Bureau of Competition, FTC.

STATEMENT OF DR. H. MICHAEL MANN, DIRECTOR, BUREAU OF ECONOMICS, FEDERAL TRADE COMMISSION; ACCOMPANIED BY JOHN MULHOLLAND AND DOUG WEBBINK, STAFF MEMBERS

Dr. MANN. I wish to emphasize that my remarks have not been cleared or reviewed by the Commission.

I have with me John Mulholland and Doug Webbink of my staff, who may be able to answer any questions of detail which may arise.

Since copies of my statement are available and the statement will be published in the record, I would like to shift to the latter part of my statement which is concerned with the public policy implications of this second energy study.

I wish to focus on the latter part of my statement, because I would like its message to come through loud and clear.

I have two comments about our efforts which I believe raise serious public policy issues. The first concerns the necessity to rely upon production data for the construction of concentration ratios. In circumstances where current production does not, as in primary fuels, translate on a 1-to-1 basis into reserve ownership, the future competitive posture of an industry is unknown. If the level of concentration in reserves is markedly higher than for production, if the reserve concentration trends are upward, and if oil companies have been or are becoming major owners of reserves, the previously stated conclusions are too modest. The difficulty is that there exist no data in the public domain on company-by-company reserve ownership. This is particularly curious since Federal agenices, the AEC, the Bureau of Mines, and the FPC are responsible for gathering data about the primary fuels. As I have stated on another occasion with respect to the first of these agencies:

> It seems anomalous to me that the Atomic Energy Commission, which is critically involved in the energy sector, and will probably be more critically involved in the future as uranium possibly increases its impact on the energy sector, that the Atomic Energy Commission apparently must get data from companies voluntarily. It does not have, apparently, the legal power to get data, which it would seem to me is rather important to have for the Atomic Energy Commission, let alone for us in our attempt to understand what is happening to this industry and what is going on.

Before going on, I would simply underscore those remarks by stating that one of the attractions of being Bureau Director at the Federal Trade Commission was my belief when I left academia that I would have access to data of a much higher quality than exists in the public domain. The quality of research in the academic community has deteriorated rapidly in the last decade, in my judgment, because of the quality of data we have available to us to test various hypotheses. I have found after 2 years, that the FTC is a little better off than academic institutions. I am appalled by the kind of data with which the Federal Trade Commission has to try to make its important decisions in the antitrust and consumer protection areas.

Mr. CHUMBRIS. Then you can understand how we feel when we get that data and have to sift through it.

Dr. MANN. In fact, as I testified before Senator Nelson in March, the Bureau of Economics has had to abandon one of its more important projects—an attempt to estimate the degree of overcharge, the cost to consumers of various kinds of pricing behavior that exist across a large number of industries. The data are not sufficient for us to continue that project. So now, 2 years later, it is no longer anomalous; the kind of data that are available is scandalous to me.

My second comment concerns the Commission's 6(b) power. For economic and statistical surveys, a 6(b) questionnaire requires clearance by the Office of Management and Budget, which includes review and comment by the Business Advisory Council on Federal reports. If there is a failure to comply after issuance, enforcement is the responsibility of the Department of Justice.

This means that two agencies of the Executive lie between the Commission and the gathering of economic information. This means that had we sought to collect data on reserves, we would have nothing to report now and probably for the next couple of years. And even if the Commission had traveled the long and tortuous route to complete compliance with the 6(b), it is not clear that the courts would not consider reserve data a trade secret, exempt from public disclosure under section 6(f) of the Federal Trade Commission Act. If exempt, the data on reserves would have had to be published in an aggregative form, a result which is less informative than a more detailed presentation.

The Bureau's economic report on conglomerate merger performance, released in January 1973, illustrates this in two ways.

First, one of the respondent companies, Litton Industries, did not lose its fight concerning compliance with the Bureau's 6(b) until September 1972, 3 years after the investigation began. Even then, compliance was not complete because we were near the end of the study and did not insist on everything we were originally after. Further, the 6(b)'s for this study did not have to go through OMB because less than 10 firms were involved. In short, collection of information with the 6(b) is not a rapid or easy process.

Second, chapter 5 of that report had to present what I consider its most important findings in an aggregative format. This requirement resulted from the hard choice of whether to pursue nine firms through the courts for complete compliance or to compromise in order to speed the completion of the study. The former strategy would have probably meant that the report would have taken another 3 or 4 years. The compromise did mean a less informative report than might have been because the readers could not observe directly and in detail the information loss arising from the suppression of financial data for highly diverse operations into consolidated statements.

I think it is clear that the Commission's 6(b) power does not appear well suited to a timely collection of essential information with which to investigate particular industries, or companies, or the economy in general. I think Congress may wish to reexamine the necessity for OMB review of and Department of Justice compliance enforcement of 6(b) questionnaires. Further, it is my judgment that the Commission should determine whether the courts would consider reserve data and financial information for disaggregated lines of business as trade secrets. If so, Congress may want to strengthen the 6(b) power.

In conclusion, Mr. Chairman, I feel so strongly about the points I have made and the frustration the Bureau of Economics had had in trying to do research to inform the Congress and the public, that I will recommend publication of our concentration study because this message will be brought out in that study. Long after these hearings are concluded and long after the energy crisis may have passed, I want this message to be on the public record. It is going to be clear in this second report. Thank you.

Senator Hart. Thank you for your candidness. That conglomerate report did strike me as a one-handed operation. If the study you are now talking about is going to be shot down as a poor job, are you willing to state and jeopardize your professional standing in order that all of us can understand the completely woeful inadequacy of the means of informing Congress and the country of what we have and where we are headed? I take it that is what you are saying.

Dr. Mann. That's correct, sir.

Senator Hart. We have been told that future competitive positions in the primary fuels depend on who has the reserves. What is your professional judgment?

Dr. Mann. I would agree with that. We recommended early that had we been able to have reserve data we would have been able to give a better picture, particularly with respect to the future in the energy sector. W realize that seeking such data through an economic survey would have meant you probably would not have seen a report until the late seventies, and might have seen it under circumstances similar to the conglomerate merger report; that is, we would have been constrained as to the amount of detail we could have revealed.

Senator Hart. You tell us in your statement that there is no data in the public domain on company-by-company reserve ownership; that is on page 8. You indicate that the Atomic Energy Commission has to get data from companies on a voluntary basis as far as uranium is concerned, and it lacks the legal power.

Have you attempted to get whatever information the ABC has obtained on a voluntary basis?

Dr. Mann. We did the following, Senator: My staff met with the staff of the Atomic Energy Commission and asked about what data we could obtain from the AEC with respect to our studies. We were told all of the data which it receives, whether involving production or reserves, it receives on a voluntary basis from the companies in the uranium industry. They said they would be glad to give us production data if the companies agreed. They further told us that in their judgment there was little point going after reserve data, because reserve data is highly sensitive. It was their judgment, if they turned either production or reserve data over to us, the companies would stop submitting data to them.

We then wrote the companies who were supplying data to the AEC and asked whether they would grant permission to the AEC to give us data, the data which was submitted to them on a production basis. Permission was so granted. We did not seek reserve data, relying on the AEC's judgment that such data would not be given and that we would have to go after it by 6(b). Since we were anxious and hoping to produce a report in a much shorter time period than the 6(b) process requires, and hoping that it would not misrepresent the competitive situation in the energy sector, we remained with the production data.

I would respectfully suggest that the Bureau of Competition's experience with respect to collecting natural gas reserve data, which is a legal enforcement effort in which OMB clearance is not required, but Department of Justice compliance is, bears out the Bureau of Economics. My judgment is that 6(b) power has many characteristics of a "paper tiger."

Senator HART. Do you get the feeling that the Government is sort of a paper tiger?

Dr. MANN. In certain respects. I am not sure with respect to the oil industry that I would call the Government a paper tiger. I think there are clear indications from the oil industry's point of view that the Government has been less than a paper tiger in supporting arrangements that have contributed to many of the problems about which we are concerned today. With respect to having data available which can be analyzed, the answer is yes.

Senator HART. Again, we appreciate your statement. In our comments now and later on in the study, you will understand we are not being critical of you; we do understand the constraints under which you had to make this study.

Mr. Chumbris.

Mr. CHUMBRIS. All I have to say, Mr. Halverson and Dr. Mann, is that if your two departments have anything to do with further statements, make sure that you don't hold the chairman up by not submitting the papers on time.

Mr. HALVERSON. He has already told us that.

Senator HART. Gentlemen, thank you very much.

Dr. MANN. Thank you very much, sir.

Mr. HALVERSON. Thank you.

[The following was received for the record. Testimony resumes on p. 335.]

MATERIAL RELATING TO THE TESTIMONY OF DR. H. MICHAEL MANN

Exhibit 1.—Prepared Statement of Dr. H. Michael Mann

STATEMENT OF DR. H. MICHAEL MANN, DIRECTOR, BUREAU OF ECONOMICS, FEDERAL TRADE COMMISSION

CONCENTRATION IN THE ENERGY SECTOR

Mr. Chairman and members of this Committee, it is a pleasure to participate in these important hearings. This is my personal statement and has not been cleared with the Commission.

I have with me Mr. Joseph Mulholland and Dr. Douglas Webbink who are the senior economists in charge of our second energy study, which is an analysis of the impact of the oil company mergers on the potential decline in concentration resulting from the increasing substitutability among the primary fuels.

The focus of this investigation arises from our finding in the first study: Interfuel Substitutability in the Electric Utility Sector of the U.S. Economy. Our report concluded that the primary fuels, at least as inputs to the electric utility sector, constituted a single market and therefore, ". . . mergers between petroleum companies and firms producing or owning reserves of other fuels should be considered horizontal acquisitions."[1] The importance of this conclusion is that horizontal mergers will offset the negative impact on concentration which comes from the joining of separate markets. The reason lies in the fact that suppliers which were once operating in separate lines of business find themselves, as their lines come to serve the same end use, competing with one another. The number of independent competitors has increased. However, if horizontal mergers bring the dominant companies under common ownership, there may well be no decline in concentration. This is illustrated in the Table attached to this statement.

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[1] Thomas Duchesneau, Interfuel Substitutability in the Electric Utility Sector of the U.S. Economy, February 1972, p. 82.

How serious this development might be depends upon the levels of concentration in the formerly separate markets and the trends in those concentration levels. Our second investigation has determined the levels and the trends, with the exception of uranium, in concentration for primary fuels and has arrived at a tentative determination of the impact of the acquisitions of nonoil fuel producers by oil firms on concentration in the overall primary fuel market. It should be understood that we have used publicly available data which are flawed. Nevertheless, we do not think that the data misrepresent the situation by any significant degree at the production stage.

It should also be understood that I am reporting some findings which may change before the final submission to the Commission. Each of the primary fuels will be discussed in turn.

Oil.— Concentration was calculated in terms of each producer's net production of crude oil. This measure ignores variations in the quality of the oil and excludes royalty oil.[2] An adjustment was made for the latter from previous estimates of the percentage of royalty oil to total production. The percentage was applied to all firms' production. The result for 1970:

	Production	Adjusted for royalty, oil
4 firm	27.1	31.0
8 firm	43.0	49.1

In terms of the adjusted figure, concentration has risen from 1955 when 4- and 8-firm concentration percentages were 21.2 and 35.9 respectively.

Natural Gas.—Concentration was measured from published company sources on marketed production for the U.S. and Canada combined (total gross amount of gas withdrawn from a reservoir minus the amount flared or returned to the reservoir). The data are not available on a consistent basis: some firms report gross production, others net (gross minus return to the reservoir and "shrinkage"); some report combined U.S. and Canadian production, others not; some exclude royalty production, others not. In some senses, then, we are adding together apples and oranges.

The result, nevertheless, is for 1970:

	Percent
4-Firm	24.4
8-Firm	39.1

Concentration has risen since 1955 when the respective figures were 18.6 percent and 30.4 percent. Although the levels are still relatively low, some factors suggest that the rise of the last decade will continue. One important factor in this trend is the success of the major petroleum companies in obtaining oil and gas leases offshore and in Alaska.

Coal.—The chief difficulty with coal statistics is that coal varies with respect to quality. Therefore, company figures and the resultant national totals are combinations of nonhomogeneous commodities—the apples and the oranges problem. Using these figures, the 1970 4- and 8-firm concentration ratios were 30.7 percent and 41.2 percent, respectively.[3]

The trend in concentration is upward: the 4- and 8-firm concentration ratios in 1955 were 17.8 and 25.4 respectively. This rise appears to be the product of a variety of economic forces, among them the economies of scale in strip mining, a method which is increasingly accounting for more and more of coal production.

Uranium.—The statistics for this sector are those reported by the AEC, with the permission of the companies, or by the companies directly. They are based on the amount of uranium oxide (U_3O_8) recovered by the integrated mining and milling companies, because data are only for integrated milling companies, and not for independent mining companies. In 1970, concentration in milling for the 4 and 8 largest integrated milling companies was 55.3 and 79.8 percent respectively.

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[2] Royalty oil is produced and controlled by the company but belongs legally to the owner of the land under which the oil resides.

[3] If captive production, that is, production by mines which are actually owned subsidiaries of other companies such as steel companies, and which does not ordinarily enter the open market, is excluded, the percentages ore 36.0 and 47.6 respectively. However, inclusion of the captive production makes economic sense since this supply can enter the open market if price and supply developments so warrant and since this production is not really distinguishable from production tied up in long-term contracts, which is included in the industry's statistics.

While there are some independent uranium mining companies, the milling companies control most of the mining. In 1970, the 15 milling companies mined 95.5 percent of all uranium ore. Applying that percent to the above milling concentration ratios, we estimate that the top 4 and 8 milling companies mined at least 52.8 and 76.2 percent respectively of U_3O_8 in 1970.

We have not yet computed a trend in uranium mining because the role of independent mines was much larger in the past. Since we cannot get their production directly, we can only report at best the amount produced by 4- and 8-largest integrated milling companies, using the same kind of procedure as above. Such a figure may understate concentration because some independent mines may have been larger than the captive mines of the milling firms. Therefore, we have no exact idea of the change in concentration over time.

Furthermore, it is only recently that uranium has entered as a competitive fuel to supply energy. In the past, the ore went into bombs or stockpiles. It is, therefore, unclear whether past concentration is fully comparable to present concentration because there were two very different industries in terms of end use.

To summarize, concentration levels appear to be relatively low in oil, natural gas, and coal, but rising markedly. In uranium, the level is substantial. The increased fuel intersubstitutability, however, acts as a deflationary force on concentration levels, unless the major firms are coming under common ownership.

OVERALL FUEL MARKET

When the four fuels are combined together using a common measure of heat content (British Thermal Units), concentration is lower than when measured separately for each of the 4 fuels. In 1970, the top 4 and 8 energy firms produced 19.0 and 31.6 percent respectively of all energy.[4] Although those concentration ratios are low, they have risen significantly since 1955 when the top 4 and 8 firms accounted for 12.6 and 22.0 percent respectively.[5]

Although several petroleum companies have acquired interests in coal and uranium since 1955, those acquisitions have had little impact on production concentration in 1970.[6] If we assumed that all coal and uranium production by the largest 30 petroleum firms was produced by independent non-petroleum firms, the top 4 and 8 energy companies would account for 18.7 and 30.1 percent respectively, insignificantly different from the percentages reported above, which included the coal and uranium production by the largest 30 petroleum firms.

PUBLIC POLICY

I have two comments about our effort which I believe raise serious public policy issues. The first concerns the necessity to rely upon production data for the construction of concentration ratios. In circumstances where current production does not, as in primary fuels, translate on a one-to-one basis into reserve ownership, the future competitive posture of an industry is unknown. If the level of concentration in reserves is markedly higher than for production, if the reserve concentration trends are upward, and if oil companies have been or are becoming major owners of reserves, the previously stated conclusions are too modest. The difficulty is that there exists no data in the public domain on reserve ownership company by company. This is particularly curious since federal agencies, the AEC, the Bureau of Mines, and the FPC are responsible for gathering data about the primary fuels. As I have stated on another occasion with respect to the first of these agencies:[7]

> . . . it seems anomalous to me that the Atomic Energy Commission, which is critically involved in the energy sector and will probably be more critically in-

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[4] This is the fraction of energy contained in the production of only those four fuels. Other energy sources such as hydroelectric power, anthracite coal and geothermal energy have been excluded from this measure.

[5] These figures for 1955 exclude all uranium production on the assumption that uranium was not part of the energy market in that year.

[6] It should be noted that ownership of coal and uranium reserves by the 20 largest petroleum firms may be far higher in percentage terms than is their percent of current production.

[7] Concentration by Competing Raw Fuel Industries in the Energy Market and Its Impact on Small Business, 1971, p. 23.

> volved in the future as uranium possibly increases its impact on the energy sector, that the Atomic Energy Commission apparently must get data from companies voluntarily. It does not have, apparently, the legal power to get data, which it would seem to me is rather important to have for the Atomic energy Commission, let alone for us in our attempt to understand what is happening to this industry and what is going on."[7]

My second comment concerns the Commission's 6(b) power. For economic and statistical surveys, a 6(b) questionnaire requires clearance by the Office of Management and Budget, which include review and comment by the Business Advisory Council on Federal Reports. If there is a failure to comply after issuance, enforcement is the responsibility of the Department of Justice.

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The Bureau's economic report on Conglomerate Merger Performance, released in January, 1973, illustrates this in two ways.

First, one of the respondent companies, Litton Industries, did not lose its fight concerning compliance with the Bureau's 6(b) until September, 1972, three years after the investigation began. And even then, compliance was not complete because we were near the end of the study and did not insist on everything we were originally after. Further, the 6(b)'s for this study did not have to go through OMB because less than 10 firms were involved. In short, collection of information with the 6(b) is not a rapid or easy process.

Second, chapter 5 of that Report had to present what I consider its most important findings in an aggregative format. This requirement resulted from the hard choice of whether to pursue nine firms through the courts for complete compliance or to compromise in order to speed the completion of the study. The former strategy would have probably meant that the Report would have taken another three or four years. The compromise did mean a less informative report than might have been because the readers could not observe directly and in detail the information loss arising from the suppression of finance data for highly diverse operations into consolidated statements.

I think it is clear that the Commission's 6(b) power does not appear well suited to a timely collection of essential information with which to investigate particular industries, or companies, or the company in general. I think Congress may wish to reexamine the necessity for OMB review of and Department of Justice compliance enforcement of 6(b) questionnaires. Further, it is my judgment that the Commission should determine whether the courts would consider reserve data, and financial information for disaggregated lines of business as trade secrets. If so, Congress may want to strengthen the 6(b) power.

ATTACHMENT—AN EXAMPLE OF THE IMPACT OF CHANGING MARKET BOUNDARIES ON CONCENTRATION LEVELS

Firm rank	Separate markets			Single market	
	A	B	C	Different firms[1]	Same firms[2]
1	20	40	30	40	90
2	20	10	10	30	40
3	10	5	10	20	25
4	10	5	10	20	25
Top four	60	60	60	110	180
Total output	100	100	100	300	300
CR_4 (percent)	(60)	(60)	(60)	(37)	(60)

[1] The dominant firms in product A are not dominant in product B, etc.

[2] Each firm has the same rank in each product line.

Source: Economic Report, "Interfuel Substitutability in the Electric Utility Sector of the U.S. Economy," February 1972 table 48, p. 84.

Exhibit 2.—Dr. Mann's Response to Senator Hart's Letter Concerning the Conglomerate Merger Study and the Concentrated Industries Studies

FEDERAL TRADE COMMISSION,
Washington, D.C., May 14, 1973.

HON. PHILIP A. HART,
Chairman, Subcommittee on Antitrust and Monopoly, U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: This letter gives you fuller detail regarding the Bureau of Economics' work on the second part of the conglomerate merger study and the concentrated industries studies about which you inquired in your letter of October 11, 1972.

As you know, the second part of the conglomerate merger study was released on January 3, 1973. It is titled *Conglomerate Merger Performance: an Empirical Analysis of Nine Corporations.* Its major conclusion was that there was a serious loss in information about sales and profits from the consolidation of acquired firms into the aggregate financial accounts of these nine companies. This issue is, of course, germane to all large, diversified enterprises, and the Bureau of Economics is negotiating with OMB to develop a line-of-business form which will permit the publication of industry profitability statistics at the 4-digit SIC level. This kind of data is not now available from any public sources. The publication of the second part of the conglomerate merger study has greatly facilitated our negotiations.

The status of the concentrated industries studies follows:

Energy.—Four studies were planned in this area. The first, *Interfuel Substitutability in the Electric Utility Sector of the U.S. Economy* has been completed and published. The second study deals with an investigation of the ownership structure within the primary energy markets: oil, natural gas, coal and uranium. Particular emphasis is being given to the effects of petroleum companies' acquisitions of uranium and coal producers on overall concentration. This study will be transmitted to the Commission this summer. The inordinate delay is largely traceable to the fact that data are either unavailable or of very poor quality.

The third and fourth investigations envisioned an examination of the effect of petroleum companies' acquisitions of coal and uranium companies on pricing and on the rate of technological innovations within the energy sector. These have not begun as staff is fully committed to other projects.

Prescription Drugs.—The purpose of this study is to explore the relationships between product differentiation expenditures and market structure in certain drug markets. A 6(b) questionnaire has been approved by the Commission. It is being pretested with six pharmaceutical companies, five of which have completed the questionnaire. We are negotiating with the remaining one about completion.

If the questionnaire requires any changes, it will be resubmitted to the Commission for approval before transmittal to OMB.

Electrical Machinery.—The study proposes to examine the effect of the antitrust case of 1960. It is alleged that in markets as concentrated as electrical equipment, there will be no substantive change in price behavior: a tacit understanding will substitute for an overt conspiracy. We intend to test that hypothesis. We expect to transmit to the Commission for approval a 6(b) questionnaire this summer.

Automobiles. The proposed study of automobiles has suffered from a variety of factors. The staff which began work on this study in the fall of 1971 was shifted to policy planning work when the Commission began an intensive effort to come to grips with the development of models to guide its resource allocation. The addition of new staff in the summer of 1972 permitted work to begin again in the fall of 1972. This has resulted in a position paper, now being formalized into a study proposal with a 6(b) questionnaire, to investigate the sources of profits of the automobile companies, particularly General Motors. There are many hypotheses that factors other than market power, e.g., managerial efficiency, risk, may explain the industry's and particular firms' persistent above-average profitability.

Sincerely yours,

H. MICHAEL MANN,
Director.

Exhibit 3.—FTC Memo of April 22, 1971, re Commission Study Alternatives in the Energy Sector

MEMORANDUM—APRIL 22, 1971

To: Commission
From: Office of Policy Planning and Evaluation
Subject: Commission Study Alternatives in the Energy Sector

A. INTRODUCTION

The purpose of this memorandum is to discuss the dimensions of Commission economic study alternatives in the energy sector of our economy. The structuring of a policy-oriented energy study for the Bureau of Economics is only one part of the Commission's essentially tripartite existing program in the energy area—which also includes a preliminary, antitrust investigation of trade association and industry practices affecting natural gas reserves, and a special merger project involving energy mergers. Here, we will focus principally on existing plans, as well as broader possibilities, for the economic study of issues affecting energy policy.

In the course of this discussion, we will do several things. *First*, we will present some discussion of the background and present posture of the Bureau of Economics' concentrated industries project—for our plans for a Commission energy study, in large part, find their genesis there. *Second*, dealing with one particular set of policy issues existing within the broader energy field, we will discuss the development of the attached Bureau of Economics' proposed protocol titled "Market Boundaries in the Energy Sector of the U.S. Economy." This proposal outlines the Bureau's present plans for a study which would focus basically on market definition and research and development in the energy field—and which would have direct enforcement significance relative to the Bureau of Competition's present energy merger project. Unlike some of the possibilities discussed in the broader-ranging memorandum which is attached, the enforcement-oriented protocol describes a study effort which is manageable in terms of present resources, and where, to some extent, relatively short-run completion can be anticipated. Third, we will briefly comment upon and present for Commission consideration that attached memorandum titled "Possible Dimensions of a Commission Energy Study." This outline of broader issues and study alternatives in the energy area has been devloped by this Office with the assistance of the Director of the Bureau of Economics. It will discuss, admittedly in a general and tentative manner, our conception of the dimensions which a broad economic energy study could assume—one which would purport to generally treat federal energy policy.

Finally, after describing some broader and narrower options for energy study, we will present some concluding remarks and recommendations as to the further course which we feel Commission programming should take in the energy area.

B. ORIGINS OF COMMISSION'S COMMITMENT TO AN ENERGY STUDY—THE CONCENTRATED INDUSTRIES PROJECT BACKGROUND AND RELATED EVENTS

While this memorandum is written principally to deal with Commission study alternatives in the energy sector, it is most important that the background and present posture of the Bureau of Economics' concentrated industries project be understood. The energy "industry" within our economy (described, typically, as encompassing petroleum, coal, natural gas, and atomic energy) has always been one of the "concentrated industries" to which the Commission has planned to devote intensive economic analysis, focusing on basic structure-performance relationships and their policy implications.

Until this year, the course of the concentrated industries project has been tortuous and disappointing. We described it at some length in our memorandum to the Commission of October 12, 1970[1] discussing energy planning. A few, brief comments here will be sufficient. The present concentrated industries project originated in the Commission minute of August 8, 1968, which directed the staff to prepare and submit a plan, including manpower estimates, for the study of important, highly concentrated industries where there are serious questions of the existence of price competition. In response thereto, the Bureau of Economics suggested six industries for study, ordered according to the following priority: (1) steel, (2) automobiles, (3) drugs, (4) electrical machinery, (5) energy industries—petroleum, coal, natural gas, atomic energy, and (6) chemicals.[2]

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[1] Dealing with the issues raised in the Sept. 1, 1970 request of the Senate Antitrust and Monopoly Subcommittee for information about Commission plans and activities in the energy field.

Subsequent to this initial planning activity, work on the concentrated industries project was suspended[3] because of the absence of the Director of the Bureau of Economics who supervised the study of the Cabinet Committee on Price Stability—released in January of 1969. In March of 1969, the Bureau Director—in a sense reinforcing the earlier priority designation established within the concentrated industries project—again recommended that the Commission proceed with an in-depth study of the conduct and performance characteristics of the steel industry.[4] He did not discuss the other five industries which had been earlier designated within the project. Responsive to this recommendation, the Commission directed, in May 1969, that the staff proceed with the steel industry study and that additional budgetary funds for it be requested.[5] Seemingly because of resource limitations,[6] neither the steel portion of the concentrated industries project—nor, apparently, any other portion—moved substantially forward prior to the summer of 1970. On July 10, 1970, in Congressional testimony, Chairman Weinberger reiterated the Commission's commitment, "to the extent resources permit," to the study of the six concentrated industries previously designated.[7]

Thus, the record stood at the time of the Commission's request that the Office of Policy Planning and Evaluation consider and report on the issues raised in the September 1, 1970 letter of the Senate Antitrust and Monopoly Subcommittee relating to Commission plans for the energy area,[8] Our memoranda to the Commission of October 5, 1970 and October 12, 1970 were in response to this instruction. In addition to recommending (1) a pilot antitrust investigation dealing with natural gas reserves, and (2) expedited Bureau of Competition treatment of energy mergers, we also made recommendations relating to Bureau of Economics handling of the energy portion—and other portions—of the concentrated industries study.

At pages 31–39 of our memorandum of October 5, 1970, we presented a discussion of structure and structural trends within energy markets. This discussion led us to conclude:

> ". . . we recommend that the Commission promptly authorize a full-scale investigation into concentration and competitive trends in the energy sector of the economy to be conducted by the Bureau of Economics with the assistance of the Bureau of Competition.
>
> "Such an investigation would attempt to fix more precisely structural changes in the energy sector, either through merger, internal expansion, or joint venture. Special emphasis should be given the increasing dominance of 'energy sources' by petroleum companies.
>
> "Contemporaneously with developing such structural information we would suggest that the Bureau of Economics take steps to evaluate whether there is any relationship between such increasing concentration and dimensions of conduct and performance, such as profit rates, price, new technology and discovery activity, including rate of development of new reserves, and competition between alternative sources of fuel."

Following our initial memorandum recommending this type of energy study, the Commission asked that we comment upon the relative priority of the energy component versus the other components within the concentrated industries project. This was the essential purpose of our second energy memorandum dated October 12, 1970. In this context, our recommendation with respect to the Bureau of Economics was as follows:

> That the Bureau of Economics be directed to prepare, as soon as possible, detailed study plans covering each of the industries which have been included within the pending concentrated industries study. Such study plans should begin with descriptions of the industries in terms of structure, behavior, and

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[2] See: Memorandum to the Commission from Acting Director, Bureau of Economics, Oct. 16, 1968.

[3] Pursuant to the Commission minutes of Nov. 27, 1968.

[4] See: Memorandum to the Commission from the Director, Bureau of Economics, Mar. 18, 1969.

[5] Pursuant to Commission minutes of May 6, 1969.

[6] See: Memorandum to the Chairman from Acting Director, Bureau of Economics, May 8, 1970.

[7] See: Statement of Caspar W. Weinberger, Chairman, Federal Trade Commission, before the Joint Economic Committee of the Congress, July 10, 1970.

[8] Pursuant to the Commission minutes of Sept. 21, 1970.

> significant current trends, and should identify important economic concerns. With this background the study plans should proceed to a discussion of what the Commission actually can and should do with respect to each respective industry, emphasizing factors such as: consumer and economic significance; resources required and ease of investigation; and the possibility of obtaining economically meaningful relief to the problems in the industry. Such industry study plans should provide the Bureau and the Commission with a sound basis for finally determining priorities within the concentrated industries study and, further, should provide a way for the Commission to determine whether or not some more immediate massive study of energy problems would be desirable and feasible. Because of the current importance of energy issues, and the fact that the energy area gives every present indication of deserving priority within the concentrated industries study, the energy area should be given immediate priority in the development of the detailed study plans.

The recommendations contained in our memoranda were adopted by the Commission, as reflected in its letter of October 13, 1970 to Senator Hart which, relative to the study of energy, declared:

> "As you know, the energy sector of our economy is one of several concentrated industries which the Commission has planned to study. Because of our concern about energy issues such as those which you raise, the Commission has directed today that the initial planning phase of the energy portion of the concentrated industries study be given high priority. We expect that this expedited planning phase of the energy portion of the concentrated industries study will provide a great deal of information which will assist the Commission in developing the further scope of our intended investigation in this field."

Identical language was utilized in the Chairman's October 13, 1970 correspondence to Congressman Evins.

In December of 1970, and March of this year, the Commission and staff met with groups of citizens and officials from the TVA area, who expressed to us their concern about competitive problems in the energy setting—particularly increasing coal prices and petroleum company extensions into competing energy sources. At these meetings, we explained our current energy program, emphasizing that a study plan for our treatment of the energy area was in development, and that, were the Commission to favor a broad commitment, additional resources would quite clearly seem to be a necessity.

This, then, has been the background from which has arisen a commitment that the Commission consider, determine and announce the scope of its intended energy study—including an assessment of the existing limitations imposed by resource availability. Ideally, we would like to have this discussion of study alternatives within the energy area accompanied by a definitive discussion of analogous, or competing, alternatives which exist within all the other industries which have traditionally been regarded as falling within the concentrated industries project.

Unfortunately, this is not possible, and the need for Commission clarifying action in the energy area is immediate. Even without the definitive comparative assessment of protocols, or study plans—for the other portions of the Bureau of Economics' concentration project, however, we believe that the Commission (having reviewed this memorandum and the attached documents) should be in a position to make substantial forward motion in structuring, and furthering the execution of, its energy study commitment. Dr. Mann will—within the very near future—submit to the Commission a "status report" on the concentrated industries project. We are now in position, however, with Dr. Mann's concurrence, to report preliminarily on the progress or status of the non-energy portion of the concentration project.

In addition to its proposed protocol describing a somewhat limited, and presently feasible energy study project within the context of the concentrated industries project. We are now in position, however, with Dr. Mann's concurrence, to report preliminarily on the progress or status of the non-energy portion of the concentration project.

In addition to its proposed protocol describing a somewhat limited, and presently feasible energy study project within the context of the concentrated industries project, the Bureau of Economics has virtually completed analogous study plans covering electrical machinery and ethical drugs.. These are instances where, in the opinion of Dr. Mann, opportunity for concentration inquiries exist which can have particular policy significance. Each of these, it is now contemplated, would take about a year to complete; combined, it is estimated that they would consume three economists and three research assistants, full-time, for a year. With respect to automobiles and steel, Dr. Mann is now reviewing the question of whether these industries should remain within the concentration study project. He presently expects that this consideration will result in his conclusion that the commitment of Commission resources in these study areas would not be justified, all things considered. The question of whether, and in what manner, the chemical industry should be treated in the concentration project is in the early stage of consideration.

In the Commission's letter to Senator Hart of October 13, 1970, it was pointed out that the purpose of expediting the "planning phase of the energy portion of the concentrated industries study" was the development of information "which will assist the Commission in developing the further scope of our intended investigation in this field."

We now turn to a discussion of the material now available—the two attached memoranda—which will hopefully be of assistance to the Commission in its evaluation of the future scope of its energy activities.

C. THE BUREAU OF ECONOMICS' PROPOSED STUDY PROTOCOL TITLED "MARKET BOUNDARIES IN THE ENERGY SECTOR OF THE U.S. ECONOMY"

As we have previously explained, there are two rather lengthy attachments to this memorandum. One of these—the subject of this immediate section of our memorandum—is the Bureau of Economics' Proposed Study Protocol titled "Market Boundaries in the Energy Sector of the U.S. Economy." We would like to briefly comment upon its development and significance.

At the time that the Commission directed that the Bureau of Economics expedite the planning phase of the energy portion of the concentrated study, it took other action which, as a practical matter, affected the directions taken by Economics as reflected in its attached Proposed Study Protocol. Our memorandum of October 5, 1970—specifically responding to an inquiry formulated by Chairman Kirkpatrick—devoted a good bit of attention to inter-fuel mergers and extensions within the energy field, particularly oil company acquisitions into the coal area. In summarizing our recommendations for an energy program, in our memorandum of October 12, 1970, we proposed:

> "That the Bureau of Competition be directed to give special priority to currently pending merger investigations in the energy field and that it be requested to present to the Commission, as soon as possible, its contemplated recommendation of a special project approach to energy mergers, which might include attempting to secure the transfer of certain energy merger matters from the Department of Justice to the Commission."

This recommendation was approved by the Commission and, similar to the Commission's direction with respect to the energy study, was reflected in the October 13, 1970 letters to Senator Hart and Congressman Evins. The letter to Congressman Evins stated, for instance:

> "Your letter specifically refers to merger transactions involving the extension through acquisition of oil companies into the coal area. A number of mergers of this type are presently under investigation by the Commission. Today the Commission directed that the staff give expedited, priority treatment to current merger activity in the energy field, including a number of pending matter."

Following the Commission's initial consideration of energy problems at the close of this past year (and its commitment to activities involving both the Bureau of Economics and Competition), it became apparent that the development of a soundly-based antitrust enforcement policy with respect to inter-fuel extensions and acquisitions would depend on the answering of some threshold economic questions. These basically enforcement-oriented questions, arising out of the initial inter-Bureau consideration of the energy problems, assumed immediate and practical importance in Economies' planning of its course of study in the energy field. Accordingly, the study plan outlined in Economics' Proposed Study Protocol titled "Market Boundaries in the Energy Sector of the U.S. Economy" is directed to policy issues which are of enforcement significance and which—in one important area—the Bureau of Economics feels can be managed rather expeditiously. In prefacing that portion of the draft protocool which describes its actual "Study Plan," the Bureau states:

> "Listed below are areas to be studied which the Bureau of Economics believes can be handled with its available resources—and are necessary and vital to any merger enforcement effort contemplated by the Commission."

The particular focal points of the study project then described, based upon the data and analysis presented earlier in the Proposed Study Protocol are: (1) an investigation into market definition in the energy area, looking primarily to substitutability among the different fuel sources, (2) Based upon such a market definition inquiry, a determination of whether energy mergers of various types should be viewed as essentially horizontal or conglomerate, and (3) Consideration of the likely research and development impact of inter-fuel acquisitions and extensions within the energy field.

It is the judgment of the Bureau of Economics that the inter-fuel substitutability area can be adequately investigated—and the associated market definition conclusions drawn (with the effect of producing a classification framework within which to view energy mergers)—rather quickly and with somewhat limited resource expenditure. The Director of the Bureau estimates that, utilizing largely public resources, the contemplated "market boundaries" study could be completed by one senior economist in three months.

Also encompassed within the existing Bureau of Economics' protocol—intended, again, as an enforcement-related project—is an investigation of the research and development impact of the inter-fuel energy mergers. The Bureau points out that, "to obtain the data necessary to evaluate the theoretical possibilities" in this area "a 6(b) questionnaire would be required as well as a substantial commitment of legal resources to insure a meaningful response." We have difficulty in estimating the resource costs and timing which would be involved in the research and development portion of the course of action which Economics proposes. Surely, there would be delay, and substantial costs in legal time, associated with an effort to obtain research and development information from the companies who have extended into competing energy resources. Our best estimate is that the research and development inquiry proposed by the Bureau, were it to be undertaken, would not be completed for roughly 1½ to 2 years, and that it would consume substantial resources in the process—i.e., probably a year of attorney time and at least a year of economist time, as well as research assistance help.

While the Bureau of Economics Proposed Study Protocol suggests a dual probe into energy market definition and the possiblities of competitive dislocation in research and development, it is important that these two, workably distinct study areas be viewed and considered separately in terms of resource demands as the Commission defines its energy commitment. In the broader memorandum which we have prepared, we discuss position of research and development issues within the larger energy list. Like the Bureau of Economics we believe that the research and development inquiry (as well as the more immediate market boundary investigation) could have great policy significance.

Another observation should be made, with respect to the enforcement-oriented course of study represented in the Bureau's Proposed Study Protocol. Review of the correspondence from Senator Hart and Congressman Evins, and the material submitted to us by the TVA group, shows that—as much as anything else—their central focus is the possible anticompetitive or "monopolistic" problems associated with oil company acquisitions and other extensions into competing energy sources. Thus, the thrust of the Bureau's Proposed Study Protocol—the answering of two basic enforcement-related questions arising out of the development of the "energy company"—is on all fours with one of the major areas of concern which has been emphasized to us by outside sources. The fact that we have now received complete clearance from Justice on the Continental Oil-Consolidation Coal transaction (discussed at pages 33–34, and 39 of our Memorandum of Oct. 5, 1970), brings vividly again the fact that priority should be afforded by the Commission to the addressing of those questions whose resolution is a prerequisite to intelligent merger policy.

D. BACKGROUND TO ATTACHED MEMORANDUM ENTITLED "POSSIBLE DIMENSIONS OF A COMMISSION ENERGY STUDY

One need only to have glanced at this week's edition of *Time* magazine in order to have been glaringly confronted again with the question of our national energy policy—and the sense that it leaves much to be desired in terms of coordination and farsightedness. The article, titled "Getting More Power to the People," asked the question "Whatever became of the great energy shortage?" It answers the question by pointing out its likely recurrence unless the United States can develop a better approach to energy problems. The assertion is made that:

> "To escape a real crisis next time around, the Nixon Administration must begin now to draft a coherent national energy policy. It must measure the nation's real energy needs for the foreseeable future and determine what combination of Government price-regulating programs, import controls and conservation measures will be required to fill those needs."

Essentially, the article goes on to compare future energy demand against some of the existing information on reserves and production capacity. These comparisons frame certain important policy questions which are emphasized, including:

1. What energy sources should the U.S. develop most intensively?
2. Should the nation tighten or loosen its limits on foreign oil?
3. What other foreign sources can be developed?

These questions, of course, go essentially to the question of fuel supply. In conclusion, the *Time* article declares:

> "Whatever the specifics, the prime essential of a national energy policy is that all pieces fit into a sensible pattern of fuel production and use. The present lack of policy is leading to a combination of intermittent shortages and soaring prices. If it continues, the nation may find itself starving for energy in the midst of potential plenty, and paying an exorbitant price as a result."

There is a cryptic reference to the "uncoordinated, sometimes conflicting and occasionally inept programs carried out by half a dozen highly independent agencies." Policies of Interior, FPC, and AEC are criticized as adversely affecting fuel prices and the development of reserves. Perhaps not too surprisingly, there is no mention of antitrust policy issues—nor even a reference to the FTC or Justice.

Another interesting, general article in the energy field titled "Cold Facts About the FUEL SHORTAGE" (*Consumer Reports*, February 1971) states:

> "Much of the blame for this winter's rising electrical and fuel prices—and for any critical shortages that may develop—rests with hydra-headed, uncoordinated, industry-oriented regulation."

Again here, the familiar questions about public policy are raised. Did the AEC prematurely push the importance of nuclear energy, and diminish the development of coal reserves? Are the development of natural gas reserves being impeded because of FPC's setting of unrealistically low prices? (Or, could producers be withholding reserves in anticipation of future gains?) What about the impact of foreign quotas; and, if they were eased, how great a problem would be presented by a tanker shortage?

The article provides an interesting, sharply-focused summary of the forces of public policy in the energy mosaic, stating:

> "The energy crisis is traceable largely to hydra-headed and uncoordinated government regulations.
>
> "The Texas Railroad Commission and the Louisiana Department of Conservation largely determines how much domestic crude oil will be pumped from the ground.
>
> "The Interior Department administers coal mine safety standards, oil quotas, and the development of off-shore oil wells and vast, untapped lodes of shale oil.
>
> "The Atomic Energy Commission lobbies for atomic energy.
>
> "The Interstate Commerce Commission affects the coal industry through its regulation of the railroads.
>
> "The Department of Health, Education and Welfare has jurisdiction over air pollution standards.
>
> "The Federal Power Commission regulates the interstate price of natural gas.
>
> "State public utilitiy commissions regulate the local price of natural gas.
>
> "The Justice Department and the Federal Trade Commission enforce the antitrust laws under which oil companies have been allowed to enter the coal and uranium business. The oil industry now owns 25 percent of the nation's coal production and 45 per cent of its known uranium reserves.
>
> "The Treasury Department administers and interprets tax laws that have an important bearing on domestic oil and gas exploration. (A Treasury Department ruling, for example, has actually encouraged huge international oil companies, such as Jersey Standard, Gulf, Texaco and Mobil, to explore for oil overseas instead of at home by deducting overseas royalties from their Federal income taxes.)"

Here, of course, the relevance of antitrust policy in the total picture is brought out.

The need for intense governmental study of energy policy is quite clear, whatever efforts that may be made in the private and academic sectors. There have been congressional proposals (e.g., Senate Resolution 45) suggesting that the Congress undertake, or commission, a special study of energy policy. The proposition has been advanced that the FTC—because of its economic expertise and investigative tools—could take on a massive special energy study, requiring the appropriation of substantial funds.[9] It will be recalled that representatives of the TVA group have evidenced a great interest in having the FTC consider a massive, general study of national energy policy. It is in this climate that the Commission now considers the structuring of its energy program.

Our memorandum titled "Possible Dimensions of a Broad Energy Study" is intended to assist the Commission in this process. With the assistance of Dr. Mann, we have prepared a discussion of the dimensions which, we feel, a comprehensive economic energy study could have. Both in terms of scope, and the resources which would be required, it goes substantially beyond the project which is outlined in the Bureau of Economics' Proposed Study Protocol.

Our point here is one of enabling the Commission to review the sorts of issues which, we feel, could be addressed in a general economic inquiry into factors relating to national energy policy—including not only antitrust policy, but also the question of fuel supply as such, which involves the roles of governmental agencies affecting the energy picture. Our discussion is not, and is not intended to be, an in-depth exploration of the various areas which might be examined in a compresensive energy study. Rather, it is an attempt to identify them and to provide our best estimate of the resource demands which would be likely to be associated with their study. Our discussion of the roles of other governmental agencies will be brief, but an analysis of their performance would be vital in a compresensive energy study.

At the close of the attached memorandum, we will summarize the alternatives which we have described, and the resource costs which we feel would be associated. We will then propose a course of action for the Commission to follow in the study of energy.

E. CONCLUSION

At the close of our more lengthy attached memorandum titled "Possible Dimensions of a Commission Energy Study", we have (1) reported on the existence of certain energy projects and studies to which other groups are committed, (2) summarized, in tabular form, the energy study options which we envision, together with associated resource cost estimates, and (3) presented some recommendations as to the approach which, we believe, the FTC should now take in the energy area. In so doing, we have attempted to place into a somewhat larger perspective the current study proposals which are contained in the attached Bureau of Economics proposed study protocol titled "Market Boundaries in the Energy Sector of the U.S. Economy."

As our attached memorandum describes in more detail, we have recommended that our concentrated industries project dealing with the energy industry be comprised of the four study components which we have discussed as appearing feasible in light of our existing resources. These study areas, as designated in our memorandum, are: market boundaries inquiry; industry structural analysis in terms of production data; effects of structural change on market power (profitability study); and effects of structural change on new investment and R&D.

In addition to making a recommendation as to the scope of the concentrated industries study in energy, we have discussed other areas of possible economic study which, although they could have great policy significance, are clearly not manageable in light of present Bureau of Economics' and Commission resources. These areas, as designated and discussed at length in our attached memorandum, are: industry structural analysis in terms of reserve data; and a long-term fuel supply study. With respect to them, we have recommended that the Commission now consider whether it wishes to undertake a special, more massive energy study—one that would clearly require special congressional appropriations for the purpose.

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[9] Some commentaries on the need for a national energy study have specifically emphasized, however, that such a study should be lodged in an entirely independent research body. The Edison Electric Institute, for instance, commenting on S. Res. 45, said: "The study should be performed by an independent research body. Many Federal agencies have regulatory and, in at least one instance, supplier responsibilities in various fuel and energy fields. In certain instances, several agencies have regulatory responsibilities in the same energy field. Thus, while it would be proper to utilize the services, information, facilities, and personnel of any of the departments or agencies of the Government, we believe the most effective study can be provided by an independent body."

However, its plans for study in the energy area are to be structured, we regard it as most important for the Commission, as expeditiously as possible, to determine the study course that it would like to take, and whether or not it would like to make special efforts toward obtaining funding for a study which would exceed our present resource capabilities.

Hopefully, based upon our memorandum and the Bureau of Economics protocol, the Commission will shortly be in a position to chart the course of its energy study and make its plans publicly known. In the course of announcing its plans for further energy activity, the Commission might wish to indicate publicly that we have now obtained complete clearance from the Justice Department with respect to the Continental Oil-Consolidation Coal merger, and that this is one of the matters which is presently under consideration and to which our immediate economic analyses will have relevance.

Respectfully submitted,

Lawrence G. Meyer,
Director.
Fred L. Woodworth,
Assistant Director.
Edward J. Heiden,
Economist.

Attachments: (i) Office of Policy Planning Memorandum on the Possible Dimensions of a Commission Energy Study;
(ii) Bureau of Economics Proposed Study Protocol on Market Boundaries in the Energy Sector of the U.S. Economy.

Attachment 1

Memorandum—April 22, 1971

To: Commission.
From: Office of Policy Planning and Evaluation.
Subject: Possible Dimensions of a Commission Energy Study.

INTRODUCTION

In this memorandum we will present, admittedly in a preliminary manner, a discussion of those policy areas which could be included in a broad economic study of the energy area. Our point here is one of enabling the Commission to review the sorts of issues which, we feel, could be addressed in a general economic inquiry into factors relating to national energy policy—including not only antitrust policy, but also the question of fuel supply as such, as well as the roles of governmental agencies which affect the energy picture. Our discussion is not, and is not intended to be, an in-depth exploration of the various areas which might be examined in a comprehensive energy study. Rather, it is an attempt to identify them and to provide our best estimate of the resource demands which would be likely to be associated with their study.

There is no assumption here about the extent to which the FTC can and should stduy energy. Clearly, within the context of the concentrated industries project, a substantial effort is going to be made by our Bureau of Economics. Utilizing the framework which is provided in this memorandum, we feel that the Commission can examine the energy study alternatives presented, in light of our best sense of: (1) Those areas which seem manageable with present resources, and (2) Those which are so massive that we could not undertake them without special funding. As to these latter areas—largely involving such things as the study of fuel reserves, and the interplay between governmental activity and the adequacy of fuel supplies—there is a basic question as to the role which the FTC should play, in light of our own responsibilities and those of other agencies. In this regard, it is important to be aware of the types of energy studies and analyses which are being undertaken by others.

We believe that this memorandum will assist the Commission in reaching a determination as to the position which it would like to take in energy affairs, and—should it wish to do so—in preparing requests for additional funding or possible suggestions for interagency projects.

In our view, a comprehensive economic study of the energy industry and energy policy issues could be organized into two basic sections. The first of these would focus on market structure and on the extent and trends of concentration within energy markets. As will be more fully discussed subsequently, the question of looking into concentration in the energy field can have a dual nature. The area can be approached either from the viewpoint of actual production or from the standpoint of reserves ownership and control—or both. The second portion of a major energy study following an inquiry into structure and structural trends would be oriented toward questions of industry performance. The performance portion of the type of inquiry which we contemplate would include such basic suggestions as: profitability; patterns of new investment and research and development activity; and the vital question of long-term fuel supply, i.e., the way in which the developing industry picture is likely to affect the actual supply of fuels by the industry to its consumers. For purposes of organization, we will structure this latter performance area to include questions as to the manner in which the various sources of federal governmental policy have an effect on fuel supply and the likely course of the fuel supply for the future.

I. Structural elements within a study of the energy industry

In our view, there are two basic issues which lie at the heart of an investigation of those elements of structure which can affect performance in the energy industry. Of immediate importance is the question of determining the extent of competitive boundaries within the various sectors of the industry. No assessment of the state of future competition within the industry can be made until it is determined what forces shape the competitive interchange among the various fossil fuel, and nuclear energy sources. Upon determination of the levels of effective competition among the various energy sources, the second phase of a structural study would consist of an investigation aimed at measuring existing concentration and concentration trends within the different energy sources. Here, substantial attention would be focused upon the roles of the major petroleum concerns and large conglomerate firms as significant and growing factors as regards the supply of non-petroleum energy sources. An analysis of the positions of these entities, as present and future suppliers of the different energy sources, could be approached from the standpoint of both present production as well as reserve ownership. We will separately discuss each of these avenues of structural investigation, explaining our judgment as to the magnitude of resource expenditure which would be associated with each.

A. The determination of market boundaries in the energy sector

There are three critical areas which should be examined in a study of substitutability among the various fuels. First, is the question of the extent to which the broad user groups actually are able to view and utilize them as substitutes (demand substitutability). Second, is the issue of the extent to which energy suppliers are able to choose between the various fuels at the production stage (supply substitutability); and third, is an investigation of the extent to which transportation and geographical considerations determine the pattern of user and supplier substitution within national or regional contexts.

Study of demand substitutability would focus on the degree of fuel interchangeability among the users of energy sources in four broad economic sectors: (1) utility, (2) household and commercial, (3) transportation, and (4) industrial.

From an initial review of the available data, it appears that fuel-use statistics are most precise and reliable for the electric utility sector, which accounted for approximately 22% of total BTU consumption-use in 1969, but whose importance is further enhanced by the fact that electric utility output itself constitutes an important additional energy source for the other three sectors. Major sources for these data include: 1) the publications of the Bureau of Mines; 2) *Steam Electric-Plant Factors*, published by the National Coal Association; and 3) the *Edison Electric Institute Yearbook*, compiled by the Edison Electric Institute of New York City.

Although the data do not seem to reveal any large-scale aggregate substitution of one energy source for another within the recent past (See Table 1 attached hereto), there are indications of substantial and increasing demand elasticity as regards individual utilities' selection of energy sources for established plants.[1]

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[1] One author argues that inter-fuel substitution of individual users is largely traceable to changes in their own production techniques. See William A. Vogely, "Pattern of Energy Consumption in the United States," *American Chemical Society* Papers presented at Detroit, Mich., Apr. 4–9, 1965, Vol. 9, No. 2.

A second type of increasing inter-fuel substitutability is evidenced by the increasingly intense rivalry between manufacturers of nuclear generating capacity and fossil-fueled capacity in their attempts to capture the new-installations utility market. Simultaneously, it would appear that increasingly stringent air pollution controls are tending to reduce the attractiveness of coal as a fuel source for utilities.

In the household and commercial market, the principal competition between the fuels takes place in the heating area. In the main, competition occurs in the bidding for heating systems in new construction rather than heating systems in existing structures. Home-owners and commercial establishments are not likely to switch heating systems and fuel use (e.g., oil to electricity) in response to slight or even moderate changes in the relative prices of the fuels. This is because the costs of switching systems are large and the cost savings benefits of switching are likely to be relatively small. In short, high transfer costs involved in a shift to another fuel tend to prevent household and commercial consumers from responding to changes in relative fuel prices.[2]

Reflective of changing fuel use patterns in the household and commercial sector, some available empirical evidence shows a continuation of the prior trend away from coal consumption. Based on data presented in Table 2, attached hereto, between 1964 and 1968, coal consumption decreased in absolute terms by about 20%. while all the other energy sources registered substantial gains (natural gas, 20%; petroleum, 27%; and electricity, 38%).

In the transportation sector, there seems to be little substitutability among fuels. The consumption of coal by railroads fell from 132 million tons in 1944 to 2 million in 1960, after which it was so small that data were no longer collected. Since airplanes and automobiles use petroleum virtually exclusively, petroleum—for all practical purposes—supplies the entire energy needs of the transportation sector.

Within the industrial sector, natural gas and coal are the most important present sources of energy, closely folowed by oil. Among the several fuels, recent usage increases in the industrial sector have differed substantially. Based on data presented in Table 3, attached hereto, between 1964 and 1968, total coal consumption (in absolute terms) increased 3%, gas 25%, petroleum 7%, and electricity 32%. Although more recent data are not available at this time, it is believed that air pollution controls have caused coal use by the industrial sector to continue its low rate of increase relative to other energy sources since 1968.

A study of supply substitutability must focus, in large part, on the extent to which current or predictable changes in technology will, in the future, allow fuels to the substituted for other energy sources. There is substantial current technological development of this type affecting the energy area; presently coal can be converted into both oil (liquefaction) and natural gas (gasification).[3] There is little doubt that this process will be commercial in the very near future, and the major companies are active in the area.[4]

Presently, gasoline produced from coal costs only a few cents more than gasoline produced from crude oil. The increasing ability of the industry to produce synthetic fuels from coal strongly suggests—at least as a threshold premise—that coal and natural gas, and coal and oil, are, more and more, becoming substitutable on the supply side.

The third important inquiry, we feel, in a study of substitutability between the various fuels involves determining the extent to which transportation and geographical considerations affect demand and supply substitutability within regional or local market contexts. Data which are currently available for fuel interchange on a natioanl basis may simply not be reflective of what is occurring at the regional level.[5] Thus far, to our knowledge, there has not been any systematic study aimed at exploring energy market boundaries on a regional or local basis.

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[2] Pietro Balestra, *The Demand for Natural Gas in the U.S.*, North-Holland Publishing Co., 1967, pp. 49–50.

[3] For a review of the kind of technological developments which could increase the degree of substitution within the near future, see Warren E. Morrison and Charles L. Reading, *An Energy Model for the United States, Featuring Energy Balances for the Years 1947 to 1965 and Projections and Forecasts to the Years 1980 and 2000*, Washington, D.C., 1963, pp. 17–18.

[4] In this connection, an article in *Chemical Week*, June 15, 1968, p. 41, indicated:

"FMC Corp. last week said that before the month was up it would sign up the contractor for a 25-tons/day pilot plant" to produce crude oil from coal.

"Hydrocarbon Research . . . has had a 3-tons/day pilot plant for severals years . . . (Edwin Lang, executive VP) figures coal-derived oil should be used at a 200,000-bbls/day rate by '74."

Atlantic Richfield has a joint research project with Hydrocarbon Research aimed at facilitating production of "liquid, petroleum-type products."

American Oil evaluated HRI process and estimates gasoline production cost of 12.1¢/gallon as opposed to HRI's estimate of 11.5¢/gallon.

Humble "has already invested $20 million in coal research and coal resources."

"Another Jersey affiliate, Esso Research . . . has formed a Synthetic Fuels Research Dept." to develop process to produce gasoline from coal.

In addressing the market boundaries question on a smaller than national basis, we would anticipate that it will probably not be possible to fully determine precise regional interchangeability delineations for the various energy sources. We do, however, anticipate that meaningful regional approximations can be developed, relying on geographic area data available from the Bureau of the Census and individual statewide breakdowns from the Bureau of Mines. In addition, there are certain academic studies of industrial organization problems within the individual energy sectors[6] which, we feel, can be helpful in this regard.

We believe, similar to the Bureau of Economics, that an investigation of market boundaries in the energy sector is a particularly important first step that should be taken within the total context of our energy investigation opportunities. It would not only establish a necessary framework within which to assess the important issues of petroleum and other conglomerate participation in the other fuel areas, but it would also be of assistance in determining the appropriate market definition approach for any antitrust proposals which might possibly result from current investigations of energy mergers. Based on an initial inspection of available data, it appears that the area of market boundary determination could be addressed within the relatively near future by relying almost entirely on existing public sources.

An investigation of this threshold issue of market boundaries can be initiated immediately by the Bureau of Economics. This particular opportunity for energy study has also been treated at length by the Bureau in the Proposed Study Protocol which it has prepared. Within a three-month period, the Bureau expects that it would be in a position to produce a study of inter-fuel substitutability—with particular emphasis on the utilities sector—which would form the basis of a Commission position as to whether energy should be viewed as one market or several.

B. The measurement of concentration in the energy sector

A major second component within the structural portion of a comprehensive energy study would consist of an attempt to measure carefully existing concentration and concentration trends—focusing in large part on the extent of oil company and conglomerate participation. The development of interfuel energy companies under oil company or conglomerate control could offset the pro-competitive implications which one would normally asosciate with increasing fuel substitutability and the resulting widening of market boundaries in the energy sector. If petroleum firms and other multi-fuel entities become the dominant suppliers of the alternative energy sources, it could be that an anticipated heightening of inter-fuel competition might not be realized to the extent that could otherwise be expected.

Assuming the existence of a commitment, as part of an energy study, to explore existing concentration and the significance of concentration trends in energy, a very significant question of methodology appears—one that has great significance in terms of project resource cost. There are essentially two basic ways of viewing the extent of petroleum company and other participation across the broad spectrum of the total energy industry, and thus attempting to explore the competitive significance of the emergence of the total energy company. The first method is to develop structural informtaion based on production; the second is to attempt the employment of data based on reserves.

The difference between the usage of production and reserve data, in attempting to develop a meaningful long-run picture of the structure of competition in the energy sector, is not merely an academic detail. Preliminary evidence, for instance, indicates that reserves are not necessarily translated into current production at similar rates by their owners; thus, the two different bases for assessing companies' participation, over time, in the energy industry could yield different results. In 1970, for example, oil companies are reported to have held about 45% of known uranium reserves, but only about 33% of plant capacity for processing those reserves.[7]

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[5] For example, while national data may show substantial inter-fuel substitutability for the electric utility sector, in the West South Central Section of the U.S. nearly all generation is by the use of natural gas.

[6] See, e.g., Reed Moyer, *Competition in the Midwestern Coal Industry* (Harvard Press, 1964); Paul W. MacAvoy, *Price Formation in Natural Gas Fields* (Yale Press, 1962; Leslie Cookenboo, *Competition in the Field Market for Natural Gas* (Rice Institute Pamphlet: No. 4, 1958; Edward J. Neuner, *The Gas Industry* (University of Oklahoma Press, 1960); and De Chazeau and Kahn, *Integration and Competition in the Petroleum Industry* (Yale Press, 1959).

A sample group of four oil firms (Atlantic Richfield, Humble, Texaco, and Sunoco) were found, upon our inspection of some preliminary data, to hold extensive coal reserves (about 5% of the national total), but none of them was engaged in current production. (The Humble Oil Company has been reported to own over six billion tons of coal reserves, giving it third position, in terms of reserves, among all coal producers and reserve holders.) Some reserve-holding companies do not appear in production statistics at all because they lease coal fields to production companies.

To the extent that the industry pattern of reserve holdings differs from the current pattern of owner production, the measurement of industry position based on reserves is probably more revealing about the state of future competition than the data based on current production. In terms of resource demands, a concentration study based on production would be infinitely less massive than an effort which would attempt to survey and analyze reserve ownership and control data. We wish here to discuss each of these energy study possibilities separately, emphasizing the nature of the data sources, and the difficulty of the study which would be involved.

1. *The evaluation of concentration of terms of production*

Data on concentration, in terms of sales and production in the energy industry, re available for all four energy sectors. We will discuss the data sources relevant to each—petroleum, natural gas, coal, and nuclear.

(i) *Petroleum.*—Production and production capacity information on an individual firm basis for petroleum is available from several sources. Among these are: *National Petroleum News;* the annual reports of individual petroleum firms; the Oil Import Administration and Bureau of Mines within the Department of the Interior; Moody's *Industrial Manual* (annual issues); *Oil and Gas Journal;* Fortune's *Plant and Product Directories*, 1963 and 1965; and the *Market Indicators* series of Dun and Bradstreet. As we have previously mentioned, transportation considerations (such as pipeline configurations) affect the shaping of market boundaries within which concentration should be evaluated in regional terms, as well as in national terms. Using the data sources indicated above, together with certain source material which might provide some help in the exploration of the regional nature of petroleum markets,[8] we estimate that Bureau of Economics could develop a fairly definitive picture of petroleum concentration in regional terms.

(ii) *Natural gas.*—Again, as with petroleum relevant competitive markets appear to be largely regional in nature.[9] In the case of natural gas, however, data which would facilitate regional concentration analyses do not seem as readily available as they are for coal and petroleum. The basic production and sales data which are available come from the Federal Power Commission, in its annual publication entitled *Sales by Producers of Natural Gas to Interstate Pipeline Companies*. However, these data have serious weaknesses for the purpose of evaluating concentration trends in terms of regional markets. This is because intrastate sales of gas are omitted from the FPC data. Although the exact size of the intrastate market is unknown, the FPC estimates these sales to be about ⅓ of the total national market. Others have placed the figures closer to 40%. Omission of these sales could be of considerable importance since, for example, it has been indicated that, in the Texas intrastate market, production concentration is higher than in the national market. We do not know, at this time, whether intrastate sales data can be obtained from the important producing states. There have been possibly helpful academic studies relevant to an attempt to delineate regional market boundaries in natural gas, and to identify production concentration trends within them.[10]

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[7] U.S. Atomic Energy Commission, *The Nuclear Industry;* 1970 (Government Printing Office, 1970), pp. 41, 3.

[8] E.g., DeChazeau and Kahn, *op. cit.*

[9] The regions accounting for the bulk of production are: the Texas-Louisiana Gulf Coast, the Texas Panhandle and adjacent portions of Western Oklahoma and Kansas, and the West Texas-Eastern New Mexico region. Points of origin are relatively distant from principal points of consumption in North Central, Northeastern and West Coast regions.

[10] Paul W. MacAvoy, *Price Formation in Natural Gas Fields: A Study of Competition, Monopoly and Regulation* (Yale Press, 1962); Leslie Cookenboo, *Competition in the Field Market for Natural Gas* (Rice Institute Pamphlet: No. 4, Jan. 1958; and Edward J. Neuner, *The Natural Gas Industry* (University of Oklahoma Press, 1960).

(iii) *Coal.*—The presence of significant transportation costs also suggests that the development of production concentration data in coal should reflect the regional nature of coal markets as a supplement to the national data. Production information is available on an annual basis from "U.S. Coal Production by Company," compiled and published by McGraw-Hill in the *Keystone Coal Industry Manual*, as well as from the American Coal Association *Bituminous Coal Fact Book*; and trade journals such as *Coal Age*. The market boundaries of concentration have already been discussed in the case of the midwestern coal market[11]; it seems likely that the midwestern study could provide a useful methodological framework for investigating other regional markets as well.

(iv) *Nuclear power.*—Unlike the other three "energy" areas, the market boundaries which circumscribe competition in the nuclear fuel industry appear national rather than regional. Though production is concentrated within a relatively small geographic area in the far West, transportation costs contribute only a small fraction of total production value and thus do not impose regional limits on competitors. Data on production concentration within this national market framework are available from: the U.S. Atomic Energy Commission. *The Nuclear Industry, 1970*. Washington, 1970 (and earlier annual issues): Arthur D. Little Company "Report to Atomic Energy Commission and Department of Justice," *Competition in the Nuclear Power Supply Industry* (Washington: GPO), 1968; and *Engineering and Mining Journal*, McGraw-Hill, March 1970. An indication of current large firm participation in uranium milling and production capacity is given in table 4, attached hereto.

(v) *Summary.*—In our earlier memoranda dealing with energy problems, we presented some preliminary data dealing with existing concentration and concentration trends within the energy sector. It appeared then that the energy industry is redirecting a significant trend toward increasing concentration, and the growth of the positions of major petroleum companies across the entire spectrum of the energy industry. The Proposed Study Protocol which has been prepared by the Bureau of Competition contains a substantial amount of presently available information on energy concentration, dealing largely at the national level. Clearly, any Bureau of Economics study concentration in the energy sector would attempt to definitively update, refine, and gather together any available information in industry concentration in terms of production and sales. The supplementation of the presently available national production and sales information with regional developed concentration data—which seems to us a prerequisite for a meaningful structural inquiry into coal, petroleum, and natural gas—could present some difficulty. We estimate, however, that the fairly wide availability of public data, together with some existing studies examining structural issues such as the nature of regional markets, would keep the dimensions of this type of effort within manageable proporitons. We estimate that one economist, working less than a year (and with the aid of a statistical assistant) could, relying almost entirely on public data, produce a significant study of production concentration and trends within the four individual sectors of the energy industry.

2. *Evaluation of Concentration in Terms of Reserve Owership and Control*

As just indicated, an industry concentration inquiry looking basically to production data—even one focusing upon regional markets—seems manageable in terms of Bureau of Economics' resource commitment. A structural industry study going to the ownership and control of energy reserves, however, would be quite a different story. As we have pointed out, viewing competitors' positions in terms of reserves may well be of greater long-run economic significance than classifying them in terms of current or recent production. With the thought that a really comprehensive energy study could well include a detailed exploration of reserve ownership patterns—examining reserves in the aggregate and on a company-by-company basis—we will here discuss the present sources of information and difficulties associated with exploring reserve ownership information for nuclear fuel and the fossil fuels. Our prior work in natural gas reserve reporting leads us to deal at greater length with the availability, and methods of reporting for gas reserve information than for the other fuel sources.

(i) *Natural gas.*—The basic source of natural gas reserve data for the U.S. is the American Gas Association (AGA). Through its Committee on Natural Gas Reserves, it annually gathers and publishes a comprehensive estimate of gas reserves, cooperating in this endeavor with the American Petroleum Institute

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[11] Moyer, *op. cit.*

(API) and the Canadian Petroleum Association (CPA). Reserve information is published in a volume entitled "Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas in the United States and Canada and the United States Productive Capacity." The most recent annual volume in this series is dated May 1970, which reports on oil and gas reserves estimated as of December 31, 1969.

The AGA gas-reporting Committee is composed of 14 members: a chairman, vice chairman, a secretary, a representative of the Bureau of Mines of the U.S. Department of the Interior, and 10 members drawn from among the ranks of the oil and gas producers. For reporting purposes, the United States is divided into 10 districts or areas. Each one of the 10 regular Committee members is assigned a district as his area of responsibility, for which he is Area Subcommitee Chairman. In carrying out his responsibility, each Chairman of an Area Subcommittee draws upon a membership composed of geologists and engineers from the oil and gas industry. The Area Subcommitees each have the responsibility for developing a total "proven gas reserve" figure for one of the 10 geographic districts.

The member of the main Committee, who is also the Chairman of the Area Subcommittee, assigns the known fields within his district among the several Subcommittee members, whose assignments may cover properties owned by their employers, as well as properties owned by others. The reports of the individual Subcommittee members are presented at a meeting of the full Subcommittee, and are subject to review and discussion. On the basis of such review and discussion, the Subcommittee then adopts a reserve figure for each field within the geographical district, and the figures that are thus adopted are accumulated in the Subcommittee report for that geographical district. In these reports to the Committee, only a total figure from the respective Subcommittee is received, and the Committee does not consider the field-by-field estimates which are proposed by individual Subcommittee members and reviewed by their respective Subcommittees. Totals are published by state and subdivisions of states, but the individual company ownership data and reserve estimates are kept confidential by each Subcommittee.[12] As we discussed in our prior memorandum on the topic, there has been criticism of the accuracy of the AGA-generated gas reserve data.[13] Whatever one's view may be about the sufficiency of the existing AGA and FPC data on gas reserves—nationally, or on a regional basis—they do not provide a company-by-company picture of industry participation in terms of gas reserve ownership and control. An independent attempt to develop this type of structural industry view would be a prodigious undertaking—organizationally, scientifically, and legally. Executing an independent national gas reserves study of any breadth would require an ability to gather, understand and evaluate massive amounts of geological data as it exists in the hands of the many producers who contribute to the total natural gas supply. This would in effect, require an effort resembling in scope and magnitude that which is annually made by all the AGA Area Subcommittees combined. Some idea of the scope of this sort of effort can be gleaned from the fact that the FPC is now preparing to carry out its own ongoing comprehensive National Gas Survey, having obtained a first year budgetary allocation of 22 people and some $340,000. It should be noted that the National Gas Survey is not intended to provide public information about the reserves positions of individual industry participants.

The presence of the AGA data, as supplemented by FPC activity, provides a good deal of information on gas reserves n a nationally and regionally aggregated basis. Attempting to secure reserves data on a company-by-company basis, however, would be an extremely burdensome undertaking.

(ii) *Crude oil.*—The primary source of crude oil reserve information for the United States is the Committee on Reserves and Productive Capacity of the American Petroleum Institute (API). According to API publications, this Committee is composed of petroleum industry management people, representatives of industry-associated companies, and governmental participants.[14]

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[12] Three other sources of information on natural gas reserves are available—all secured independently by the Federal Power Commission. These are: (1) Annual Reports (FPC Form No. 15) of Interstate Pipeline Companies, which include statements of the natural gas reserves under commitment contractually; (2) Submissions in Pipeline Certification Proceedings, which involve proof of sufficient reserves when a pipeline seeks authorization for a new project; and (3) Litigated rate-making proceedings, for which gas reserves issues and reserve data themselves are reported and explored to varying degrees.

[13] The Commission presently has open a preliminary investigation to determine whether there is any substance to allegations as to collusion or other unlawful activity with respect to natural gas reporting.

[14] American Petroleum Institute, *Organization and Definitions for the Estimates of Reserves and Productive Capacity of Crude Oil,* June 1970, pp. 2–10.

The organization and procedures employed in crude oil reserve estimation are very similar to those employed by the American Gas Association in its estimation of natural gas reserves. For crude oil estimates, the U.S. is broken into 14 geographical areas and each area is assigned to a separate Subcommittee. District Subcommittees have primary responsibility for the determination of reserve estimates in their areas. Since reserves of associated-dissolved natural gas are closely related to crude oil reserves, close cooperation is maintained between the API and the AGA, including the sharing of basic data.

The crude reserve data are published on state and regional bases rather than in terms of individual company ownership. The underlying company data on estimated reserve ownership is afforded strict confidential treatment. Aggregate data are published in the annual API publication entitled "*Reserves of Crude Oil, Natural Gas Liquid, and Natural Gas in the United States and Canada.*"

Crude oil reserves are reported as either "proved" or "indicated additional reserves." The former designation is used for reserves which have been supported by actual production or conclusive tests. The latter characterizes those reserves where capacity for future production has not been conclusively determined. From various contacts with other agencies and groups currently reviewing the energy supply situation,[15] we have found a general lack of access to crude oil reserves data on an indvidual firm basis. We understand, however, that some fragmentary reserve data and projected reserve additions on an individual company basis have been made available to the Cabinet Task Force on Oil Import Control.[16]

As was the case with respect to natural gas, an independent attempt to develop information on crude oil reserves, on a company-by-company basis, would be a massive and difficult undertaking, wholly apart from the obvious likelihood that companies would not provide reserves ownership information without having been forced to do so in litigation. Thus, an attempt to evaluate petroleum structure in terms of reserves held by the industry participants would appear to be a task of great magnitude—certain to involve the use of compulsory process, on an industrywide basis.

(iii) *Coal reserves.*—There is no systematic collection of coal reserve ownership data for individual firms. While data are available from the *Geological Survey* of the Bureau of Mines on estimated coal reserved by geographical areas, it does not, except in the most incomplete way, attempt to link reserve quantity information with ownership.[17] The only reserve ownership data for important coal producers comes from the public reports of the companies and statements of their top officials. Reserve estimates for the top 15 coal producers are presented in Table 5 attached hereto, based on this type of information.

Part of the problem involved in attempting to measure reserve ownership by individual firms is the inherent nature of mineral rights ownership. One company, for example, might own a parcel of surface land while another owns the subsurface mineral rights, or a limited leasehold interest in them for a term of years. To further complicate the situation, a second company may hold a substantial minority interest in those holding mineral rights. Still another part of the coal reserve information problem is that coal companies are not required to file reports of land ownership (or mineral rights ownership) with the U.S. Bureau of Mines.

Despite the above, there is some scattered information regarding individual firm ownership of coal reserves.

Data reproduced in Tables 6 and 7 attached hereto, for instance, indicate the leading coal positions of some of the nation's largest firms, including both steel companies and firms involved in other energy sectors.[18]

Some data are available on computer tape from the Bureau of Land Management dealing with coal permits and leases applicable to federal lands. This production, however, accounts for only about 1% of the national total. The pattern of private coal holdings on the federal domain for the larger coal companies—as well as oil companies and large steel and utility firms—is presented in Table 8 attached hereto.

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[15] These include: Office of Science and Technology; Joint Committee on Fuel Supply composed of representatives of Commerce, ICC, AEC, FPC and Interior, and operating out of the Office of Emergency Preparedness; and the Council of Economic Advisers.

[16] Cabinet Task Force on Oil Import Control, *The Oil Import Question,* February 1970.

[17] For a very helpful recent compilation of structural information on the coal industry, including a survey of available reserves information, see Laurence D. Beck and Stuart L. Rawlings, *Coal: The Captive Giant. A Report on Coal Ownership in the United States* (Washington, 1971).

[18] Included, *inter alia,* are: Bethlehem Steel; Ashland Oil; Southeastern Gas; International Harvester; U.S. Steel; Occidental Petroleum; Kennecott Copper; Consolidation; Georgia Pacific; Eastern Gas and Fuel; Union Carbide; and Pittston.

Although the United States Bureau of Mines has not maintained substantial information on the coal reserve holdings of individual companies, a study is currently being undertaken by the Bureau of Mines' Fossil Fuels Division, which will attempt to determine the known reserves of pollution-free, low-sulfur coal, by asking companies to voluntarily submit this data. Completion is hoped for by the winter of 1971.

Clearly, an attempt to obtain complete coal reserve information on a company-by-company basis would require a great resource expenditure. Attempting to compel the numerous producing and reserve-holding companies to give accurate figures on their known reserves would entail not only a considerable legal effort in enforcing compulsory process, but also, since reserve quality is not uniform in terms of variety and cost of extraction, considerable amounts of geological and other technical expertise to analyze, collate, and compare results.

(iv) *Nuclear energy.*—The Atomic Energy Commission is the major source of statistics on domestic uranium reserves. The basic information is publicly reported in the AEC publication, *Statistical Data of the Uranium Industry.* It presents data on total uranium reserves, production levels, and drilling activities. The AEC does not publish the basic, underlying firm data. Reserve estimates are computed by using confidential data provided on a voluntary basis by the individual companies,[19] utilizing company engineering production, and cost information. Only those reserves whose existence is supported by sample data and which are indicated by cost analysis to be profitably recoverable are included.

The AEC also published an annual review of the entire nuclear industry.[20] It contains, *inter alia*, a comprehensive review of events in: (1) raw materials, (2) processing and fabricating, (3) nuclear components and equipment, and (4) reactors.

Initial inspection indicates that uranium reserve ownership patterns within the industry cannot be established from the public AEC data listed above. Although AEC officials, as a part of our recently-established liaison arrangement, have shown a willingness to cooperate with the Commission in its study of the energy industry, they have explained that—because of the confidentiality of the underlying company data—they may not be in a position to make it available. The matter is still in the exploration stage at the time of this report.

In our judgment, it is unlikely that individual firm nuclear reserves information would be provided absent our use of compulsory process. As with the other energy sectors discussed above, an attempt to obtain definitive nuclear reserve information from the industry in this way would, we feel, produce difficult litigation. An attempt to avoid this course, through the independent development of information on nuclear reserves, would be virtually impossible.

(v) *Summary.*—Earlier, we have pointed out that concentration analysis in energy—the analysis of the structural positions of important competitors, and the significance of those positions—could proceed at two levels. A production (and sales) oriented concentration inquiry in energy, we have suggested, could be done relatively easily by the Bureau of Economics and, indeed, is clearly assumed in their Proposed Study Protocol.

As the immediately preceding brief sections have shown, an attempt to do a reserve-oriented analysis of competitive positions in energy would be a mammoth undertaking. While there are aggregated reserve estimates available, systematic company-by-company data on reserves just is not available. If, because of the long-run needs of antitrust policy and/or the illumination of the future fuel supply situation, it were to be determined that public policy required a much more definitive federal awareness of patterns of industry reserve ownership. how could such a policy be executed? An awareness of the magnitude of the FPC's Natural Gas Survey, and the reporting operations of the AGA and API, compels the conclusion that an energy industry reserves survey—even one based on reporting and audit—would require a large staff, diversified scientific and technical skill, and an annual appropriations into the millions, probably for some years. The Commission is clearly not presently in a position to undertake an intelligent evaluation of structure in the energy industry based on patterns of reserve ownership, even if the industry would voluntarily submit reserves data—which is presumably would not.

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[19] U.S. Atomic Energy Commission, *Statistical Data of the Uranium Industry,* Grand Junction, Colorado, Jan. 1, 1970, p. 13.

[20] U.S. Atomic Energy Commission, *The Nuclear Industry, 1970, op. cit.*

II. Performance Elements Within A Study of the Energy Industry

As was the case with respect to the inquiries which could be undertaken in the "structural" portion of an energy study, the possible components within the "performance" area break out into different categories in terms of feasibility. Some seem manageable in light of present resources; others do not seem feasible in view of our capabilities and other responsibilities.

We envision that a performance study in the energy field would be organized into three basic patterns. First, an inquiry would be made as to whether changing market structure (i.e., the apparent increasing petroleum firm and conglomerate firm dominance within the context of a wider energy market) has been accompanied by evidence of those phenomena (such as higher profit levels) which point to an increased use of market power in the relevant energy markets. Second, we would envision an investigation of the extent to which structural changes may have been accompanied by alterations in the rate of development of new technology and discovery activity, as well as installation of new capacity. The third element, which we have designated within this "performance" phase, would be an evaluation of the fuel-supply area, a performance dimension which reflects basic reserve availability, structural change in the industry, and the externalities of governmental policy formulation.

We will discuss each of these areas separately, outlining briefly the study objectives of the area, the nature of current knowledge therein, the foreseeable limitations in the study and our observations as to the manpower costs which would be involved.

A. Effects of Structural Change on Market Power Indicators Within the Energy Sector

The study of performance of the energy sector within the context of changing market structure should, in our estimation, begin with an initial attempt to assess whether increased petroleum and conglomerate firm participation in the broad energy market has given rise to increased evidence of the use of relevant market power with respect to acquired or retained energy assets. Specifically, it should be determined whether the replacement of previously unaffiliated or independent energy firms by petroleum companies has had significant effect on the rate of return on investment of the acquired firms' assets—or on the rate of return of previously held petroleum assets. It is generally agreed that pre- and post-acquisition comparisons of rate of return constitute an appropriate indicator by which to measure an acquiring firm's utilization of market power within markets into which it has extended.[21] Presumably, if an acquiring petroleum company was able to transfer existing marketing power to newly acquired assets, this would be expected to show up in a rate of return on those acquired assets which would be above that of the pre-acquisition independent firm.

A pre- and post-acquisition profit study, as we now envision it, would focus primarily on formerly independent coal companies and, to a lesser extent, uranium mining and fabrication companies acquired over the past few years by petroleum and conglomerate firms. Several acquisitions would be analyzed. These are summarized in Table 9, attached hereto, together with relevant quantitative data and information where available on dates of acquisition and the estimated market shares of the firms involved.

Since our basic focus would be on petroleum and conglomerate extensions into non-petroleum energy categories, we would exclude from our profit rate performance sample the oil company acquisitions of other petroleum companies,[22] as well as the activity of the natural gas sector whose rate of return is regulated.

At least one source has suggested that profit data for the coal industry may show a high post-acquisition rate of return in comparison with pre-acquisition levels. According to McAteer,[23] the profit margin for the coal industry has been

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[21] See, for example, J. S. Bain, *Barrier to New Competition*, Harvard University Press, 1956; L. W. Weiss, "Average Concentration Ratios and Industry Performance," *Journal of Industrial Economics*, XI, No. 3 (July 1963), pp. 247–252; W. S. Comanor and T. A. Wilson, "Advertising, Market Structure, and Performance." *Review of Economics and Statistics*, XLIX, No. 4 (Nov. 1967), pp. 423–440; R. A. Miller, "Marginal Concentration and Industrial Profit Rates," *Southern Economics Journal*, XXIV, No. 4 (Oct. 1967) pp. 259–268; and N. H. Collins and L. E. Preston, "Price-Cost Margin and Industry Structure." *Review of Economics and Statistics*, LI, No. 3 (Aug. 1969), pp. 271–286.

[22] Five producers—Union Oil, Sun Oil, Atlantic Richfield, Phillips and American—who together have about 25% of natural gas production and over 30% of refining capacity—have all consummated mergers with other large refiners and/or marketers.

[23] Davitt McAteer, *Coal Mining Health and Safety in West Virginia* (1970), p. 371.

12% to 15% during the past two years, which covers the period immediately following many of the acquisitions in question. This is above previous industry profit levels during the the late fifties and earlier part of the sixties (see Table 10 attached hereto) and is also above the rate of return for a few other natural resource industry groups (see Table 11 attached hereto). As Table 12, attached hereto, makes clear, the eight companies which acquired coal and uranium firms all ranked in the top 150 of *Fortune's* 500 and (except for General Dynamics) had an average rate of profit in 1970 (13.9%) which was well in excess of the normal rate for manufacturing of 9.1% for the year.

Information on pre-acquisition profits on specific coal and uranium acquirees could be obtained through public sources (e.g., *Moody's Industrial Manual*) in the case of single line firms, and through subpoenas and 6(b) reports for post-acquisition data and/or where several lines of business are involved. Until such time as more detailed reporting of profit data by divisions or product lines is required, conglomerate and inter-fuel firms with energy subsidiaries and divisions need not disclose separate financial information about individual lines of business—such as coal operations.

We envision that it would take a senior economist three to four months to obtain and analyze results of this phase of an energy performance study. The necessary 6(b) reports should be quite narrow in scope and would be addressed to a relatively small number of firms. Based on the Commission's experience with obtaining profit information in the course of Phase Two of the Bureau of Economics' ongoing conglomerate merger study, difficulties of compliance might arise. We would accordingly envision some, possibly substantial, attorney time to secure compliance. Conceivably, compliance might not be obtained at all for a few firms.

It must be emphasized here that a pre- and post-acquisition profit rate analysis would merely be an initial step in a larger evaluation of performance. The definitive interpretation and evaluation of results of such a study of the effects of structural changes in the energy industry on profit rates, would involve bringing to bear other factors which can affect profit rate performance. For instance, while a high post-acquisition rate of return for acquired coal assets could be a manifestation of an acquiring company's market power, it could also reflect increased efficiency resulting from the installation of new equipment. It could also simply indicate the presence of special supply and demand factors such as genuine production scarcity or excessive foreign export demand.

B. Effects of Structural Change on New Investment and Research Development

The second portion of the "performance" phase of an energy study, in our view, would consist of an investigation into the effects of changing market structure on research and development. This area, like the "market boundaries" inquiry discussed earlier in connection with structure, received substantial emphasis in the Bureau of Economics Proposed Study Protocol suggesting some immediate enforcement-related study activity in the energy area.

Several critics have pointed out the possibility of adverse effects upon the development of competing energy sources occasioned when relatively new firms have substantial investments in several actually and potentially competing sources of energy.[24] For instanc, it has been asserted that important tchnological developments, such as the process of converting coal to oil—believed to be imminent—are being purposely stalled by petroleum firms with significant coal properties. The largest of the coal to oil conversion experiments is located in Cresap, West Virginia, where the U.S. Office of Coal Research, in 1963, gave Consolidation Coal Company (presently owned by Continental Oil) a $22 million grant to expedite a process for converting coal to synthetic crude oil. Consolidation is reported to have indicated, in the early 1960's, that it expected to have such a conversion process in operation in 10 years.[25]

The operation actually commenced initial operations in November 1966 (shortly after Continental Oil acquired Consolidation) and, since that time, it has been reported that "continued mechanical problems" have stalled the operation.[26] At the present time, the operation is apparently shut down; and it is not expected to recommence operation until late 1971.[27] It has also been reported that Consolidation Coal—since being acquired by Continental Oil—has postponed its plans for the commercial use of a lignite gasification plant by the early 1970's. While there may well be determinative business reasons for these delays, they raise a threshold question as to the vigor with which joint oil-coal firms pursue the development of conversion processes.[28]

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[24] They are, *inter alia*: Resources for the Future *U.S. Energy Policies: An Agenda for Research* (Johns Hopkins Press, 1963), pp. 140–141; James Ridgeway, *The Politics of Ecology* (1970): Bruce C. Netschert, Abraham Garber and Irwin Stelzer, *Competition in the Energy Markets: An Economic Analysis*, National Economics Research Associates, Inc., 1970: James E. Watson, Manager of Power, Tennessee Valley Authority, Testimony in Hearings on S. 2752 before the Subcommittee on Intergovernmental Relations of the Senate Committee on Government Operations, Aug. 3, 1970, pp. 737–8; S. David Freeman, Director of the Energy Policy Staff, President's Office of Science and Technology, Testimony before Subcommittee on the Judiciary, May 5, 1970, p. 28. Some of these critics' statements have been summarized in Beck and Rawlings, *op. cit.*, pp. 120–128.

[25] Beck and Rawlings, *op. cit.*, p. 24.

With respect to another technological process dedicated to converting coal into pipeline-quality gas, there may be an issue as to the delay of technological innovation by multi-fuel energy firms. Messrs. Charles Ertel and Carl Sopcisak, engineers with Sterns-Rogers Corporation, have stated that this process—called the "Hygas" process—could be developed commercially by mid-1974. However, they have predicted the postponement of this development by the multi-fuel energy companies until 1978 or 1980.[29]

Still another advocate of the theory that conversion processes are being purposely delayed is James Ridgeway. In *The Politics of Ecology*, he claims:

> "The oil companies want to control coal partly because coal competes with oil and natural gas, but also because they recognize the potential for turning coal into gasoline. Gasoline is the major money-maker for the oil men, and they want to keep tight hold of any development in that field. To do so, oil firms buy coal companies; they also lobby hard within the federal government to make sure development of coal is forestalled." [30]

In a prior memorandum, we raised the issue of whether it is reasonable to expect oil companies to proceed vigorously with research in nuclear energy feasibility for uses now served by gas and petroleum, or whether large diversified national corporations with interests in several competing energy sources and products might deliberately withhold supply and new capacity, or slow the rate of technological development. In this connection, it has been strongly suggested, by at least one prominent industrial organization economist, that heavy commitments to fixed investments, such as an oil refinery, will lead such oil firms to discourage a cost-reducing innovation until they have amortized or nearly amortized their original investment.[31]

An inquiry into the question of possible delay of uranium development could look to several potential sources of information. Continental Oil, as part of a joint venture with Pioneer Nuclear, has a milling plant which has been planned for start-up in 1972, and, it is estimated, will account for approximately 5% of total milling capacity. Similarly, Humble has a plant scheduled for 1972 start-up which should account for about 6% of total capacity. Kerr-McGee has announced plans for additional mines and mills, but reportedly does not have a firm construction schedule. Gulf Oil, in conjunction with Allied Chemical, has announced future plans to build a fuel reprocessing plant as well as facilities capable of converting recovered, slightly-enriched uranium nitrate solutions to the UF–6 needed for nuclear reactions. Completion has been scheduled for 1973. Gulf had originally entered both reactor and fuel production through acquisition of General Dynamics' General Atomic Division. Atlantic Richfield, which originally began nuclear fuel production with a leading firm acquired in 1967 (Nuclear Materials), has likewise indicated similar plans for a new plant, scheduled for a 1976 completion date.[32] Getty Oil, which entered uranium production through a 1968 acquisition of Nuclear Fuel Services, had also announced future plans to build added processing and fabrication capacity. Table 13, attached hereto, presents the estimated present and future capacity plans for all companies within any phase of nuclear energy production. Potential projects involving oil companies are circled.

While we realize that, as with coal-oil conversion, a variety of business factors could delay completion of nuclear energy plants by petroleum firms, we believe that more definitive answers could be sought to questions concerning the extent to which the presence of competing energy positions has already, or might, contribute to the delay of plant construction and related technology. We would contemplate that such an inquiry would include not only the nuclear and coal-oil-gas conversion areas, but could extend to other extraction areas as well—such as exploration of the commercial feasibility of extraction of oil from shale or tar sands, the development of the nuclear fuel cell, or of the fast-breeder nuclear reactor.

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[26] *Ibid.*, p. 80.

[27] *Ibid.* Reported also in Hearings before the Senate Select Committee on Small Business, Part 2. Mar. 15–17. 22; Apr. 6, 1967; pp. 766–768.

[28] Beck and Rawlings, *op. cit.*, p. 81.

[29] *Ibid.*

[30] James Ridgeway, *op. cit.*, p. 130.

[31] William Fellner, "The Influence of Market Structure on Technological Progress," *Readings in Industrial Organization and Public Policy*, 1958, pp. 277–296.

[32] At present, Atlantic is believed to be the firm having the largest, most sophisticated conversion capacity.

Relevant to this general study area, there is some evidence, albeit relating only to petroleum technologies, that suggests tentatively that petroleum firms have performed somewhat better in the areas of invention and innovation than have other manufacturing sectors of our economy.[33]

While there have been questions about delays of innovation within the energy field, the industry vigorously refutes the notion that it has slowed the rate of expansion or technological development within any fuel area. Consolidation Coal, for instance, explains that, in the year following acquisition (1968), it developed 10 new mines, which would account for increased annual production of about 3% of the nation's total of steam and metallurgical coal sold to industrial customers. In response to assertions as to the possible withholding of coal production for the purpose of inflating coal prices, a Continental spokesman has stated:

> In the three years, 1967 through 1969, capital outlays and commitments for new mines and expanded capacity at existing mines totaled $174 million. This compared with $65 million spent by Consolidated for the same purpose in the three years prior to the merger. Since 1966, we have built or are building 15 new mines and are forecasting annual coal production of approximately 80 million tons by the end of 1972. In other words, Continental has almost tripled the rate of capital investment in order to double coal production since the merger. If the industry had expanded production at the same rate as Consolidated between 1966 and 1970, there would be a surplus coal production in 1970 of approximately 150 million tons rather than a threatened shortage.[34]

Similarly, a representative of Island Creek Coal, discussing the effects of its acquisition by Occidental Petroleum, has stated:

> When Island Creek was purchased it had a net worth of approximately $81 million, was producing 26 million tons of coal annually and sold only 4.7 percent of the market. Our long range programs left Island Creek with relatively limited expansion plans. Once we were purchased by Occidental, our plans changed virtually over night. Indeed, within the first year, our plant investment doubled when Occidental made available $175 million in new building funds, a sum since vastly increased and is due to approximate $500 million in the years ahead.
>
> With that one decision, Occidental moved Island Creek into a stronger competitive position within the coal industry, permitting us to open a number of new mines with resultant increased supplies for all coal users, as well as a new metallurgical source for sales overseas. In the next 5 years, by example, we will open 21 new mines and by 1975 will have tripled production. Our sales to utilities will grow from 3 percent of the market to 9 percent as we produce 35 million tons of steam coal. Over-all, we will produce a total of 61 million tons, another instance of almost tripling production, which will raise our share of the market from 4.7 to 9 percent.[35]

In some instances, it seems that an inquiry into the possibility of research and development retardation would occur within the context of physical expansion of capacity. The two issues, although frequently related, can also be distinct.

In our view, a study of the effect of structural changes in the enegry industry on a new plant capacity and technological innovation should proceed along two quite specific fronts. First, it will be necessary to evaluate the post-merger effect of acquisitions on the development of capacity in the markets of the acquired properties. This can be done, in part, by comparing pre- and post-acquisition openings and closing of mines or wells, for acquired energy companies, with the analogous performances of entities which has remained independent. Data on coal mine ownership and production are available for each mining company by geographic district in an Annual Report published by McGraw-Hill (*The Keystone Manual*). By collating reports from one year to another, we should be able to analyze at least partially the acquired coal company growth performance for periods before and after acquisition, as compared with that of independent coal firms.

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[33] Edwin Mansfield, *The Economics of Technological Change* (Norton and Company, 1963), pp. 24, 28, 103–110.

[34] Beck and Rawlings, *op. cit.,* p. 23.

[35] *Ibid.,* page 37.

In the emerging nuclear energy field, new mining activity by petroleum and other firms, which have entered through merger and internal expansion, is available through the Atomic Energy Commission. Preliminary inquiry with AEC indicates their willingness to supply the FTC with helpful data relevant to this performance dimension. Concerning the question of possible energy company delays in new drilling and investment activity in natural gas, the Federal Power Commission has available some helpful data concerning the new drilling activity of gas wells to supply interstate markets.

For this particular aspect of a performance study—an examination of apparent relationships between structural change and the development of capacity—we believe that resource costs would be limited. We estimate that it would require roughly one-half man year of economist time.

The second part of a performance study dealing with new plant capacity and research and development (R and D) would consist of an attempt to obtain pre- and post-acquisition data on changes in R and D expenditures and efforts for specific individual projects in the coal and nuclear fields (*e.g.*, coal-to-oil conversion, pollution abatement, coal-to-gas conversion, new nuclear plant construction). To this end, it would be hoped that concrete data could be obtained, not only on pre- and post-acquisition changes in project direction, scope and funding, but also "motivational" data on the underlying intention as reflected in corporate documents. In the course of such a study, we would have to be certain that general, industry-wide phenomena were not confused with narrower acquisition-related developments. Consequently, it would be necessary to compare pre- and post-acquisition patterns of technological commitment for acquired firms, against analogous patterns for firms which have not been acquired.

Since this type of information is not publicly available, the issuance of 6(b) orders and subpoenas would probably be necessary. Information requests on investment and technological project changes could probably be rather specifically structured. Since this information is proprietary and highly sensitive, we would anticipate the necessity of persistent efforts to obtain compliance.

Our requests for similar research and development data from conglomerate firms in the Bureau of Economics' merger study met with substantial resistance—even in the absence of actual litigation. It should be noted here that four of the nine firms there involved insisted repeatedly and vigorously that material on corporate investment and R and D intentions did not exist. Indeed, one company in the conglomerate study, even under the direct threat of litigation, did not supply any investment data.

Although it is difficult to estimate, we believe considerable attorney time, probably at least a year, would be necessary to obtain basic information for this R & D inquiry, and that such information might still be only partial. Assuming that the necessary information is collected, we estimate that its analysis and preparation would probably consume roughly a year of economist's time, assuming the existence of adequate research assistance. Taking all things into account, our best estimate is that the sort of research and development inquiry which is here described and which has also been proposed by the Bureau of Economics, would not be completed for roughly 1½ to 2 years. Since research and development, and the development of new plant capacity are vitally important to the future of energy competition, we believe that these aspects of an energy performance study are highly important and that they would represent a legitimate commitment of the Bureau's available resources.

C. *Long-term Fuel Supply*

The most important issue in the entire energy area is the question of how an efficiently-supplied, adequate flow of energy from various sources can be assured at competitive prices over the next several years—so that, as *Time* magazine put it, "All the pieces fit into a sensible pattern of fuel production and use." [36] As the recent *Time* magazine article declares:

> "Whatever the specifics, the prime essential of a national energy policy is that all pieces fit into a sensible pattern of fuel production and use. The present lack of policy is leading to a combination of intermittent shortages and soaring prices. If it continues, the nation may find itself starving for energy in the midst of potential plenty, and paying an exorbitant price as a result." [37]

For the purposes of organizing this memorandum, we have placed the topic "long-term fuel supply" within the "performance" area. Needless to say, the study of determinants of present and future patterns of energy supply also includes topics which we have earlier discussed as "structural"—such as the extent and ownership of reserves. A comprehensive study of all factors which determine patterns of fuel supply would require a massive resource commitment, in addition to that which has been postulated for the study options already described. There are a number of governmental agencies whose policies significantly affect fuel supply; the analysis of their performance alone would constitute a study area of great complexity and magnitude.

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[36] Time magazine, Apr. 19, 1971.
[37] *Ibid.*

An exploration of the long-run energy supply area would build upon what is known and can be developed about the structural and performance aspects of the energy industry—the type of material previously discussed in this memorandum. From this base, it would then be necessary to identify and analyze the impacts of external factors—such as the presence of the varying governmental activities—which interplay with the normal economic forces in determining the pattern of national energy supply. Keeping in mind that single variables in the fuel supply picture—such as the action of one government agency—have a tendency to precipitate action by other forces which affect fuel supply, we will now briefly discuss some of the specific additional dimensions which would have to be involved in a comprehensive fuel supply study.

(i) *Oil.*—A comprehensive study of supply conditions in the oil industry would have to assess the impact on supply of direct and pervasive governmental controls. Illustratively, state product controls such as those imposed by the Texas Railroad Commission and the Louisiana Department of Conservation determine, to a large extent, how much domestic crude oil will be pumped from the ground. The Interior Department, too, administers oil import quotas and the development of off-shore oil wells and oil shale properties.

In addition, federal tax law considerations—such as the availability of depletion deductions and foreign tax credits—have an important bearing on both domestic and foreign oil and gas exploration. The Federal Power Commission's regulation of the interstate price of natural gas affects domestic exploration for oil as well as gas.

Without further elaboration, it is clear that governmental policies have an important effect on the availability of petroleum as a source of energy supply, and indirectly the prices within this energy market. A study of the effects of these direct governmental factors would also require the evaluation of collateral issues bearing upon the long-run petroleum supply picture. For example, if foreign oil were otherwise available, possible tanker shortages at any time cold affect the extent to which foreign sources of oil could be relied upon.

(ii) *Coal.*—Of great significance to an evaluation of the importance of coal in the energy supply picture are the regulations and activities of the Interstate Commerce Commission—for coal moves almost exclusively by rail. In this connection, the available supply of coal cars becomes an important factor in the reliability and availability of coal as a future fuel source. At the present time, coal cars are in short supply. Industry spokesmen believe the railroads underestimate the demand for coal in the 70's (and thus, the demand for coal cars).

As Table 14, attached hereto, indicates, in 1961, coal exports approximated 34 million tons, while in 1969 such exports exceeded 56 million tons. An analysis of the possible continued growth of such export trade would be significant in this phase of a long-run supply study. Obviously, the extent of future coal export trade would depend on the policies of importing foreign nations which, in turn, are likely to be affected by treaty or reaction to our own import policies. The recent emphasis on more stringent air pollution limitations has increased the demand for low-sulphur coal, and future air pollution standards will continue to increase this demand. The availability of such low-sulphur coals—a subject presently under government study—will largely determine the feasibility of coal as a long-run fuel source and may also affect substantially the stringency of air pollution standards themselves.

(iii) *Natural gas.*—The Federal Power Commission's regulation of natural gas is of the greatest significance in any analysis of natural gas as an energy source. Some have said that the development of natural gas reserves had been, and is presently being, impeded because of the FPC's setting of unrealistic low prices for gas in interstate markets. If the industry has reacted to such regulatory policies by diminishing its exploration for and development of gas reserves, those factors alone could cause serious dislocation in terms of the supply of this fuel source—one which is of particular importance.

In addition to analyzing the impact of the FPC's regulatory performance, an analysis of supply conditions and prospects with respect to natural gas should consider also the effect of the Department of Interior's policies concerning offshore gas reserves. In this respect, it should be noted that some have alleged that Interior's bidding procedures discourage small producers from participating in the development of the Outer Continental Shelf by not permitting lessees to prorate payments for such leases.

(iv) *Nuclear energy.*—A present study of the significance and future role of nuclear energy as a fuel source might not be as formidable as comprehensive supply inquiries for the other energy sources. Cost and demand data bearing on nuclear energy is available, and the Atomic Energy Commission (AEC) has indicated its willingness to cooperate fully in such a study.

It should be noted, however, that some have criticized the AEC for prematurely relying on the availability and economic feasibility of nuclear energy. Nuclear energy, at the present time, has not fulfilled AEC projections made for it in the early 1960's, and critics allege that this failure has aggravated the demand picture for coal, which in turn has created shortages and higher prices. These possibilities would require study attention in an evaluation of the factors which have effected, and will continue to affect, the supply of nuclear energy.

(v) *Summary.*—It has been suggested that the FTC—because of its economic expertise and available investigative tools—could, with additional funding, undertake a massive special energy study, including an analysis of supply prospects and problems. Without intending any implication as to whether this is something that the agency would wish to undertake as a special economic study project—one which would require a performance analysis of other agencies[38]—we wish to provide some estimate as to the huge resource commitment which would be required.

In this immediate section of our memorandum, we have—referring to the four major fuel sources—attempted to provide a sense of some of the complex dimensions which would be involved in a comprehensive "fuel supply" study, over and above the structural and performance components which would normally be associated with something such as a concentrated industries project in energy. We have pointed out some of the important ways in which the various sources of public policy affect the patterns by which the industry participants make decisions to supply the various fuel sources. An energy supply study, therefore, would require the participation of experts familiar with the operations and impact of the governmental agencies which affect the course of energy supply.

In addition to requiring the availability of experts able to analyze the performance of agencies and branches which contribute to national policy, an energy supply study project would require a substantial group of other individuals with special skills. One source dealing with the personnel requirements which would be associated with an energy project study has stated:

> "Such a study group would need to include geologists concerned with the estimation of resources and reserves; mining and petroleum engineers concerned with technology of production and recovery, econometricians concerned with extracting cost functions from the myriad of historical and cross-sectional statistics available for many of the mineral fuels; and economists concerned with the impact of industrial organization on cost and price practices."[39]

We have already explained our assessment of the extreme resource commitment which would be involved in attempting to evaluate competitors' relative positions in the energy industry in terms of ownership and control of reserves. If such reserves study were not made within the context of concentration analysis—a study option previously discussed—we envision that something analogous in magnitude would have to be carried out as part of a comprehensive fuel supply study.

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[38] Relevant to this, it is interesting to note that some commentators on the need for a national energy study have specifically emphasized, however, that such a study should be lodged in an entirely independent research body. The Edison Electric Institute, for instance, commenting on S. Res. 45, said: "The study should be performed by an independent research body. Many Federal agencies have regulatory and, in at least one instance, supplier responsibilities in various fuel and energy fields. In certain instances, several agencies have regulatory responsibilities in the same energy field. Thus, while it would be proper to utilize the services, information, facilities, and personnel of any of the departments or agencies of the Government, we believe the most effective study can be provided by an independent body."

[39] *U.S. Energy Policies, An Agenda for Research, A Resources for the Future Staff Report*, Resources for the Future, Inc., The Johns Hopkins Press, 1968, at p. 136.

It seems quite clear that, should the FTC undertake overall fuel supply study, a special task force approach within the agency would be required. Such a task force would probably require the following: (1) a director without other responsibilities, supported by a general administrative assistant and at least two research coordinators to assist in structuring and directing the study; (2) a large number of economists and lawyers, expert in the variety of difficult problem areas which have been discussed; (3) a number of consultants to advise on specific technical matters; and (4) sufficient clerical, research and secretarial assistants. Such a project, in our estimation, would take at least two and probably three years to complete, given adequate resources.

Our judgment is that, assuming the availability of the types of personnel expertise which would be needed, the annual numerical manpower resource required would approximate or exceed those presently allotted to our Bureau of Economics. We regard it as no exaggeration to suggest, conservatively, that this type of project would consume over $2 million annually for a period of three years, for a total of nearly $6 million. This estimate might be on the low side. Needless to say, an effort of this magnitude would require special appropriations.

III. Concluding comments

In concluding this discussion, we will do three things. First, we will report on the existence of certain energy projects and studies to which other government agencies—and some other groups—are committed. Second, in summary, virtually tabular form, we will list the energy study options which we have here described, together with an indication of the resource costs which we estimate they would involve. Third, we will present some recommendations, reflecting our sense of the approach which the FTC should take to energy. This will place the existing Bureau of Economics proposals within the perspective of other energy study alternatives which might, or might not, be pursued.

A. *A Discussion of Some Other Existing Study Projects or Plans Within the Energy Sector*

Relevant to a determination of the degree of resource commitment which should be made to a study of the energy industry is, of course, the degree of activity of other agencies and study groups. By way of summary of other activity in the energy area known to us, it appears that several agencies have publicly expressed an interest in a broad energy study, and two inter-agency energy boards have been established. However, only one of the proopsed studies appears to address itself to specific problems of competitive structure and performance in the energy industry. In addition to agency proposals, there are at least two pending Congressional resolutions which propose broad-based energy studies.

Federal Power Commission.—The FPC, as discussed herein and in our earlier memorandum of October 5, 1970, is conducting a National Gas Survey, which is expected to take about three years to complete. This study is concerned with gas producers and transmission companies and involves several areas of inquiry. These include: 1) R and D programs in the area of liquefaction and gasifaction of coal—focusing principally on technical questions and difficulties rather than competitive issues; 2) pipeline reserves and deliverability of gas; 3) Canadian imports of liquefied natural gas (LNG); and 4) natural gas demand and supply. It would appear that most of the resource input for this study will come from the FPC engineering staff. For the current fiscal year, $250,000 has been appropriated; for fiscal year 1972, $301,000 has been requested. FPC indicates that a comparable figure will be requested for fiscal year 1973.

Interior.—The Interior Department has an energy project underway involving the compilation of statistics on production, consumption, and patterns of technological change, dealing primarily with the oil and coal industries. It does not include so far as we can determine an analysis of competitive factors in the energy area.

Atomic Energy Commission.—The AEC, on a consistent and recurring basis, collects and publishes data for all areas of the nuclear energy field. In the past, it has employed outside consultants to study competitive issues involved in the nuclear energy area. Arthur D. Little, Inc. conducted a cooperative study during 1968 for the AEC and Justice Department, in which it assessed the state of competition in the entire nuclear power supply industry, including an evaluation of the competitiveness of the major segments of the industry. This study focused generally on structural determinants of competition in the nuclear field, including general principles of guidance for the application of the antitrust laws, as well as the optimal mix of government and private participation.[40] However, it did not address itself to specific empirical issues such as the significance of oil company participation in the nuclear fuel cycle or the specific measurement of structural concentration. So far as we know, the AEC has no intention of updating or extending its competitive analysis to include the structural and performance issues which concern us here.

Inter-agency study groups.—The Joint Board for Fuel Supply was created by Presidential order during the crisis atmosphere of 1970 and is chaired by the Director of the Office of Emergency Preparedness. This inter-agency board includes representatives from the Interstate Commerce Commission, Federal Power Commission, Atomic Energy Commission, and Departments of Commerce and Interior. It seems primarily to be concerned with the review of short-term supply issues, including problem areas such as coal transportation. The Board was charged with coordinating the efforts of federal agencies in dealing with fuel supply and transportation problems during the 1970–71 heating season.

A Domestic Council, headed by the Chairman of the Council of Economic Advisers, was created also during 1970, with the mandate to study long-range national energy policy and present policy proposals to the President. While, in theory, this group is concerned with all aspects of the energy industry, we are not certain of the extent to which it will focus substantial attention on competitive aspects of energy supply. This should be explored.

Legislative Proposals.—Several Congressional Resolutions calling for energy studies have been introduced. Senate Resolution 45, sponsored by Senators Randolph and Jackson, proposes a study which would consider 1) current and prospective energy resources, 2) current and prospective energy requirements, 3) the impact of government policies affecting energy producers, 4) the impact of technological developments affecting production, distribution, and transportation, 5) the maintenance of a sound competitive structure in the supply and distribution of energy, and 6) the effect of any policy recommendations on economic concentration in the industry. Hearings have been held on this proposal and it was favorably reported out of the Interior Committee on April 5, 1971, and is before the Rules Committee. Similar resolutions have recently been introduced in the House. However, no hearings have yet been held on these two House resolutions.[41]

Private efforts.—Resources for the Future, Inc. (RFF), a privately funded non-profit research group devoted exclusively to issues of development conservation and use of natural resources, is heavily involved in energy research. Presently, RFF is in the process of preparing a prospectus entitled *Priorities in Energy Research*, at the request of the National Science Foundation.[42] According to present plans, it will be similar to their *U.S. Energy Policies; an Agenda for Research*, prepared in 1968 for the Office of Science and Technology,[43] which treated in fairly general terms a broad range of institutional, regulatory and economic characteristics of each energy sector. It did not, however, treat issues of concentration or structure-performance relations within the energy sector.

According to a spokesman at RFF, the new effort will be a compilation of research topics, and will be used to support a massive NSF energy research effort. According to RFF, competitive working of energy markets—focusing on petroleum—will be studied, although not intensively.

B. *Summary of Options for an Economic Energy Study*

Listed below, essentially in tabular form, is a summary of the study options discussed here, together with an indication of the associated resource cost estimates which we have made. The list of possible study topics is references according to the relevant pages herein.

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[40] Arthur D. Little, Inc., *Competition in the Nuclear Power Supply Industry*, Report to U.S. Atomic Energy Commission and the U.S. Department of Justice, Washington: December 1968.

[41] H.R. 365, introduced by Rep. Link (N.D.); and H.R. 375, introduced by Rep. Giaimo (Conn.), 92nd Congress, 1st sess. 1971.

[42] Resources for the Future, Inc., *U.S. Energy Policies: An Agenda for Research* Johns Hopkins Press, 1968.

[43] National Science Foundation has directed two additional inquiries in the energy area, which are currently being done under contract: A survey of writing and current research in the area; and an engineering-oriented study of energy and technology.

Possible Study Topics

Structural elements:	*Performance elements:*
A. Market boundaries inquiry (pp. 4–11) Completion in about three months by one economist.	A. Effects of structural change on market power-profitability study (pp. 31–34) Completion in 3–4 months by one economist, following availability of data. Likely delay in compliance.
B. Industry structural analysis in terms of production data (pp. 13–18) Completion in less than one year by one economist with research assistance.	B. Effects of structural change on new investment and R & D (pp. 35–45) Probable completion in 1½ to 2 yrs. Project to consume one economist year, and one attorney year.
C. Industry structural analysis in terms of reserve data (pp. 18–29) Would require large, technically qualified staff and annual appropriation into millions. Completion in several years. Litigation to be anticipated.	C. Long-term fuel supply study (pp. 45–54) Would require large staff, with diversified technical and scientific expertise. Completion in several years with annual appropriation in neighborhood of $2 million.

C. Recommendations

As we indicated at the outset of this memorandum, we have intended here to identify and discuss possible study topics which could be included within an economic study relating to energy policy. In so doing, we have presented information on the extent of existing knowledge in th evarious areas, and have also briefly given our views about some of the ways in which the study topics could be approached. With respect to each of them, we have also given our estimate of the resource commitments which would be associated.

We recognize that—particularly as to the more massive study options, dealing with industry reserve ownership patterns and long-run fuel supply—our resource estimates are presently only rough approximations. However rough they may be, the preceding tabular summary shows that, in terms of manageability, the alternatives which we have described break out into two basic categories.

Four of the study options which we have discussed—although there is variance among them as to estimated manpower cost and time for completion—fall within a general category of being manageable by our Bureau of Economics. Referring to the preceding tabular summary, these include the following: market boundaries inquiry; industry structural analysis in terms of production data; effects of structural change on market power (profitability study); and effects of structural change on new investment and R & D. We believe that these four study areas all have substantial policy significance and would logically constitute components within an energy "concentrated industries study" of the sort which has been contemplated by the Commission for some time.

In its Proposed Study Protocol, the Bureau of Economics has discussed the market boundaries area extensively and has also indicated the desirability of an R & D performance inquiry. We have attempted to supplement the Bureau's Protocol with: (1) additional discussion of the execution and resource costs of an R & D performance study; (2) an exploration of our sense of the approach which should be taken in inquiring into concentration itself, taking into account regional markets; and (3) an explanation of our belief that an energy concentration study should include an empirical look at profitability data within the performance area.

As we have become more familiar with the various plans and possibilities that exist for study within the energy area, we have increasingly developed the conviction that it is most important for careful work to be done addressing competitive issues, as well as the more popular questions of supply capability and long-run reserve adequacy. Thus we believe that this agency can make a real contribution by carrying out a concentration study comprised of the four components which we have discussed and which appear feasible in light of our existing Bureau resources. To the extent that our discussion of a presently feasible energy concentration study deals with study options not addressed in the Bureau of Economics' Proposed Study Protocol, it is our understanding that the basic courses of study which we envision have the approval of Dr. Mann.

In addition to the four energy study components which would appear to be feasible in light of present Bureau resources, and which would fall logically into a concentration project dealing with structure-performance relationships in the energy industry, we have also here discussed two other major areas of possible economic study within the energy sector. Referring again to the preceding tabular summary, these more massive study alternatives are: industry structural analysis in terms of reserve data; and long-term fuel supply. As our discussion indicates, these possible study alternatives have a substantial overlapping similarity because of the fact that they would each involve an extensive inquiry into reserves data with respect to the four basic fuel areas—petroleum, natural gas, coal and nuclear.

As to the intelligent development of long-run competitive policy, it is clear that the public interest would be served if energy antitrust planning could be based—at least in part—on viewing the industry in terms of reserves ownership and control. So, too, as the recent furor regarding an "energy crisis" has shown, would the public interest be served by a systematic policy-oriented study of all the factors which enter into both the short-run and long-run fuel supply problem. In light of the magnitude of these energy study alternatives, however, it is clear to us that the Commission could never undertake them without securing substantial additional funding. With this in mind, and because of our need to develop and make known an understanding of the position which the FTC plans to take in the energy field, it now seems appropriate for the Commission to consider whether or not it would like to attempt some sore of massive undertaking in the energy field.

Respectfully submitted.

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Director, Office of Policy Planning and Evaluation.
FRED L. WOODWORTH,
Assistant Director, Office of Policy Planning and Evaluation.
EDWARD J. HEIDEN,
Economist, Office of Policy Planning and Evaluation.

Attachments:

TABLE 1.—ELECTRIC UTILITY GROSS CONSUMPTION OF ENERGY RESOURCES BY MAJOR SOURCE, 1964–68

[Percent; trillion Btu]

Year	Anthracite	Bituminous coal and lignite	Natural gas, dry	Petroleum	Hydro	Nuclear	Total (percent)
1964	0.6	51.7	23.2	6.1	18.1	0.3	100
1965	.5	52.4	21.6	6.7	18.5	.3	100
1966	.5	52.3	22.2	7.5	17.1	.5	100
1967	.4	50.8	22.1	7.9	18.2	.6	100
1968	.4	50.4	23.1	8.4	16.8	.9	100

Source: "Minerals, Yearbook," 1968, vols. I–II, pp. 24–25.

TABLE 2.—HOUSEHOLD AND COMMERCIAL GROSS CONSUMPTION OF ENERGY RESOURCES, BY MAJOR SOURCE 1964–68

[In trillion Btu]

Year	Anthracite	Bituminous coal and lignite	Natural gas, dry	Petroleum	Utility, electricity purchased	Total
1964	191	560	5,314	5,190	1,795	13.050
1965	168	546	5,518	5,635	1,948	13.815
1966	143	575	5.945	5,766	2,101	14,530
1967	128	497	6,223	6,206	2,257	15,311
1968	121	447	6,581	6,581	2,469	16,069

Source: "Minerals Yearbook," 1968, vols. I–II, p. 24.

TABLE 3.—INDUSTRIAL GROSS CONSUMPTION OF ENERGY RESOURCES, BY MAJOR SOURCE, 1964–68

[In trillion Btu]

Year	Anthracite	Bituminous coal and lignite	Natural gas, dry	Petroleum	Utility, electricity purchased	Total
1964	115	5,362	7,397	4,184	1,544	18,602
1965	101	5,640	7,671	4,138	1,634	19,184
1966	88	5,806	8,203	4,352	1,788	20,237
1967	90	5,553	8,599	4,298	1,868	20,408
1968	80	5,536	9,258	4,474	2,043	21,391

Source: "Minerals Yearbook," 1968, vols. I–II, p. 24.

Table 4—Capacity of selected uranium milling companies and plants

Company:	*Nominal capacity tons ore per day*
The Anaconda Co	3,000
Atlas Corp	1,500
Continental Oil Co.—Pioneer Nuclear, Inc	[1] 1,700
Cotter Corp	450
Dawn Mining Co	500
Federal-American Partners	950
Humble Oil & Refining Co	[1] 2,000
Kerr-McGee Corp	7,000
Mines Development, Inc	650
Petrotomics Co	1,500
Rio Algom Mines, Ltd	[1] 500
Susquehanna-Western, Inc	2,000
Union Carbide Corp	3,000
United Nuclear—Homestake Partners	3,500
Utah Construction & Mining Co	[2] 2,400
Western Nuclear, Inc	1,200

[1] Planned for 1972 start-up.

[2] Under construction (1971 start-up).

Source: U.S. Atomic Energy Commission, 1970, p. 43.

Table 5—Ownership and reserve patterns of the fifteen largest coal producers

Parent company:	*Coal reserves*
Continental	7,000,000,000
Kennecott	6,000,000,000
Occidental	4,100,000,000
Pittston	1,500,000,000
U.S. Steel	(1)
General Dynamics	500,000,000
Eastern	1,500,000,000
Bethlehem	314,000,000
Pennsylvania-Virginia	300,000,000
SOHIO	(2)
A. Metal	2,700,000,000
Gulf	500,000,000
North American	1,000,000,000
Occidental (Maust)	(2)
S. Illinois	1,000,000,000

[1] Some 50 years worth.

Source: Beck and Rawlings, *op. cit.*, p. 67.

Table 6.—Coal land ownership and assessed value in Kentucky

Company:	*Assessed value*
Bethlehem Mines Corp	$5, 305, 813
Kentland Coal & Coke	5, 152, 690
Kentucky River Coal	3, 567, 951
Ashland Oil	3, 121, 652
Fordson Coal Co	2, 575, 319
Elkhorn Coal Co	1, 961, 810
Virginia Iron, Coal & Coke	1, 789, 749
Southeastern Gas Co	1, 572, 441
International Harvester	1, 546, 500
Big Sandy Co	1, 542, 420
U.S. Steel	1, 438, 550
National Mines Corp	1, 253, 888
J. M. Huber & J. M. Huber Corp	925, 980
Island Creek Coal Co	788, 422
Western Pocahontas Corp	711, 840
Kycoga Land Co	681, 118
W. W. Lindsay	639, 121
Peabody Coal Co	599, 790
Penn-Virginia Corp	592, 858
C. A. Lee	588, 000
Bringardner Lumber Co	511, 350
N. Y. Mining & Mfg	473, 950
Blackwoods Land Co	451, 400
Columbia Fuel Corp	439, 032
Mary Helen Coal Co	368, 133
J. M. Asher & Asher Coal Mining Co	356, 490
Harkins Mineral Corp	325, 000
Lawrence Tierney Land Co	317, 847
Pocahantas Land Corp	284, 380
Republic Steel Corp	280, 305
Morely H. Ringer	259, 000

Source: Data is taken from *Kentucky Coal,* by Richard Kirby, 1968, as reported in Beck and Rawlings, *op. cit.,* p. 101.

TABLE 7.—COAL LAND OWNERSHIP, ACREAGE, AND ASSESSED VALUE BY FIRM IN WEST VIRGINIA

Company	Total acreage	Total assessed value
Pocahontas Land Corp. (N. & W. RR.)	341, 496	$20, 320, 700
Consolidation Coal Co. (Continental Oil)	329, 801	11, 987, 310
C. & O./B. & O. RR	212, 163	7, 799, 835
Georgia-Pacific	195, 845	5, 400, 880
Eastern Associated Coal (Eastern Gas & Fuel)	103, 775	5, 106, 820
Island Creek (Occidental Petroleum)	103, 405	7, 908, 370
Bethlehem Steel	84, 580	3, 960, 245
Chas. National	82, 068	2, 759, 200
Berwind	69, 081	2, 094, 095
Union Carbide	59, 617	41, 511, 060
Tetrick	53, 522	469, 330
Rowland	51, 848	3, 804, 250
Gauley Coal Land Co	51, 840	816, 050
Beaver Coal	51, 664	3, 301, 490
Cotiga Devlop	48, 919	1, 010, 350
Cole, Lindsay & Woods, Trustees	43, 194	3, 226, 375
Penn-Virginia	41, 994	1, 865, 090
United States Steel	40, 440	1, 558, 600
Federal Coal	37, 825	1, 298, 050
Wheeling Dollar Savings & Trust	37, 216	1, 880, 445
Dingess-Rum	37, 135	2, 364, 825
Youngstown Mines	33, 822	3, 333, 770
Southern Land Co. & Dickinson Properties, Inc	30, 350	1, 152, 325
Youghiogheny & Ohio Coal	28, 979	601, 950
Pittston	27, 678	2, 204, 570

Source: Data is taken from Davitt McAteer's "Coal Mining Health and Safety in West Virginia," 1970, pp. 496–97, as reported in Beck & Rawlings, op. cit., pp. 102–3.

TABLE 8.—NONPRODUCTIVE COAL PERMITS AND LEASES OF LARGE COAL AND OIL COMPANIES AS OF AUGUST 1970

Company	Acreage	Date acquired
Consolidation Coal (Continental Oil)	38,032.62	1967, 1969, 1970
Peabody Coal Co. (Kennecott Copper)	50,561.81	1967, 1968, 1970.
United States Steel	5,096.18	1967.
North American Coal	4,208.97	1962, 1964–66, 1967.
Kerr-McGee oil	55,677.11	1965, 1967, 1969, 1970.
Atlantic Richfield Oil	51,000.25	1964, 1966–67, 1967–68, 1970
Sun Oil Co	36,390.98	1968, 1969.
Gulf Oil Corp	540.49	1964.
Texas Alberta Oil	5,084.84	1967.
Wood's Petroleum	14,249.05	1969.
Carter Oil Co. (Humble Oil Subsidiary)	15,651.51	1963–65.
Seneca Oil Co	6,336.12	1967.
Belco Petroleum Co	4,551.46	1970.

Source: Data taken from the Bureau of Land Management, August 1970 (computer tape), as reported in Beck & Rawlings op. cit., pp. 106–7.

TABLE 9.—OIL AND CONGLOMERATE COMPANY ACQUISITIONS INTO COAL AND NUCLEAR ENERGY

Nature of acquisition	Acquiring firm	Acquired firm	Acquired firm, percent of market[1]	Date of acquisition
Coal	Continental Oil	Consolidation Coal Co	11.0	1966
Do	Kennecott Copper	Peabody Coal Co	11.0	1968
Do	Occidental Petroleum Co	Island Creek Coal Co	5.0	1968
Do	Standard Oil (Ohio)	Old Ben Coal Co	2.0	1968
Do	American Metal Climax	Ayrshire Collieries	1.9	1968
Do	Gulf Oil Co	Pittsburgh & Midway Coal Mining Co	1.7	1963
Do	Occidental Petroleum Co	Maust Coal & Coke Co	1.3	1969
Do	Ashland Oil & Refining	Archer Mineral	1.0	1968
Nuclear energy	Atlantic Richfield	Nuclear Materials	(2)	1967
Do	Getty Oil	Nuclear Fuel Services	(2)	1968
Do	Gulf Oil	General Atomics Division of General Dynamics.	(2)	1967

[1] Based on 1968 total national coal tonnage.
[2] Not available.

Source: Moody's Industrial Manuals; and Beck & Rawlings, op. cit., pp. 10–11.

TABLE 10.—AVERAGE RATE OF RETURN ON INVESTED CAPITAL (NET PROFIT) FOR A SELECTED SAMPLE OF FORMERLY INDEPENDENT COAL FIRMS FOR SELECTED YEARS

Company and year	Sales	Assets	Sales rank	Average[1]
Peabody Coal:				
1958	$92,591	$151,309	365	12.6
1963	159,881	248,582	319	
1965	208,301	292,467	310	
Consolidation Coal:				
1958	282,234	362,104	145	8.7
1963	283,873	250,513	197	
1965	316,054	447,832	217	
Island Creek Coal:				
1958	90,003	76,976	374	7.6
1963	83,175	100,585	473	
1965	109,554	107,441	500	
Pittston:				
1958	207,717	175,451	(2)	10.8
1963	262,891	201,838	(2)	

[1] Percent of return on invested capital for selected period.
[2] Not available on a comparable basis with other 3 coal manufacturers, since Pittston is primarily a coal wholesaler.

Source: Derived from Fortune "Plant and Product Directories," 1958, 1963, 1965

TABLE 11.—PERCENT RETURN ON COMMON STOCK FOR VARIOUS INDUSTRY GROUPS, 1957–65

Year	Coal	Copper	Integrated oil	Aluminum
1957	10.8	8.0	9.5	11.7
1958	7.4	6.3	7.2	8.0
1959	7.6	7.0	8.0	8.3
1960	7.7	7.6	8.2	6.8
1961	7.8	6.9	7.7	6.5
1962	8.0	7.4	8.0	7.7
1963	8.8	6.6	8.9	6.6
1964	10.0	8.2	9.2	8.0
1965	10.8	10.6	10.5	10.0

Source: Derived from "Standard & Poor's."

TABLE 12.—NET PROFIT AND OTHER DATA FOR FIRMS MAKING LARGE COAL ACQUISITIONS, 1970

Company	Coal ranking	Fortune ranking	Net profit as percent of invested capita
Continental	1	36	12.1
Kennecott	2	111	14.9
Occidental	3	44	20.3
G. Dynamics	6	33	.8
SOHIO	10	97	5.3
A. Metal	11	147	12.5
Gulf	12	10	12.4
Occidental (Maust)	14	44	20.3

Source: Fortune "Plant and Product Directory," 1970; and "Keystone Coal Manual."

TABLE 13.—COMMERCIAL CAPABILITY TO PROCESS AND FABRICATE NUCLEAR FUELS

		Capabilities		
Firm	Conversion of uranium ore	Processing and/or fabrication of fuels or fuel elements	Research and development of nuclear fuels	Processing of scrap
Allied Chemical Corp	X	0	0	0
Atlantic Richfield NUMEC	X	X	X	X
Atomics International	0	X	X	F
The Babcock & Wilcox Co	F	X	X	F
Battelle Memorial Institute	0	0	X	0
Combustion Engineering Inc	F	X, F	X, F	0
Continental Oil-Pioneer Nuclear	F	0	0	0
General Electric Co	X	X	X	X, F
W. R. Grace Washington Research Center	0	0	X	0
Gulf General Atomic Co	F	F, X	F, X	F
Jersey Nuclear Co	F	F	F	F
Kerr-McGee	X	X	X	X
National Lead Co	0	X	0	0
Nuclear Chemicals & Metals Corp	F	X	0	0
Getty-Nuclear Services Inc	X	X, F	X, F	X
Nuclear Metals Division, Whitaker Corp	0	X	X	0
Tennessee Nuclear Specialists Inc	X	X	0	0
Texas Instruments Inc	0	X	0	0
United Nuclear Corp	X	X	X	F, X
Westinghouse Electric Corp	X	X	X	F, X

Note: X—Denotes present domestic capability. F—Denotes future domestic capability. 0—Denotes no current or future capability.

Source: Atomic Energy Commission, "The Nuclear Industry," 1970, pp. 82–83.

TABLE 14.—BITUMINOUS COAL EXPORTS SINCE 1961

[Net tons, thousands]

Calendar years	To Canada	To all other countries	Total
1961	11,169	23,801	34,970
1962	11,410	27,004	38,413
1963	13,762	33,316	47,078
1964	14,187	33,782	47,969
1965	15,660	34,521	50,181
1966	15,829	33,474	49,302
1967	15,308	34,220	49,528
1968	16,748	33,889	50,637
1969	16,788	39,446	56,234

Source: "Keystone Coal Industry Manual," 1969.

Attachment 2

PROPOSED STUDY PROTOCOL

MARKET BOUNDARIES IN THE ENERGY SECTOR OF THE U.S. ECONOMY

(Prepared by the Bureau of Economics, Federal Trade Commission)

A. Energy use and sources

The extensive use of energy, generated mainly from fossil fuels, is a fundamental characteristic of the U.S. economy. Energy is consumed as both a final product, as in the case of residential heating, and as an input in a production process.

(1) *Total consumption.*—In 1969, total energy consumption equalled 65,645 trillion Btu's.[1] Consumption has grown at an annual compound rate of 3.1 percent since World War II. However, in recent years the rate of growth has increased significantly; between 1965 and 1969 it was 5.0 percent.[2]

During 1967, the industrial sector was the largest consumer of energy, accounting for approximately 32 percent of the total. The distribution of Energy Consumption by Major Consumer Groups is presented in Table 1.

(2) *Energy consumption relative to gross national product and population.*—To a large extent, the significance of energy in an economy is not fully indicated by viewing the total amount consumed nor by the composition of consumption. Additional information, especially about the efficiency of energy use, can be obtained by relating energy consumption to population levels and GNP. The Energy-GNP ratio is greatly influenced by technological changes in the production of energy, changes in the relative importance of the various fuels, and structural changes in the composition of GNP.

Table 2 relates energy consumption to the value of GNP and the level of population for the 1947–69 period. Per capita energy consumption has generally increased since 1958, although prior to 1958 there are years in which the value decreased. A somewhat different situation exists in the case of consumption per dollar of constant dollar GNP. While the value of this ratio has fluctuated, it exhibits a general tendency to decline over time. At the present time, the value of this ratio is increasing.

(3) *Energy sources.*—Primary sources of energy in the U.S. include coal, petroleum, and natural gas. While not presently a major source of energy, nuclear power has great potential. Electricity, while considered to be a secondary source since it requires an input of a primary energy source, is an increasingly important source of energy.

The relative importance of the individual fuels has undergone great changes over time. The use of coal reached a peak around the 1910 period.[3] As coal declined in importance, the position of oil dramatically improved. In Table 3 it can be seen that natural gas emerged as an important energy source after the World

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[1] Includes minerals fuels, hydropower, and nuclear power.

[2] U.S. Senate, Subcommittee on Antitrust and Monopoly, "Testimony of Bruce C. Netschert, Abraham Gerber, Irwin M. Stelzer," May 1970, p. 3.

[3] See Netschert and Schurr, *op. cit.*, pp. 37–38.

War II period. The relative position of gas continues to improve, helped by conservation pressures for the use of a clean fuel. Nuclear power has great potential but presently provides a rather insignificant percentage of total energy.

(4) *Summary.*—Energy is by any criteria, a vital, and possibly the most crucial factor in the U.S. economy. Energy consumption has grown at a rate of 5 percent between 1965 and 1969. At the same time, energy consumption per capita has increased while energy use per dollar of GNP has tended to decrease.

Industrial users of energy have been the most important consumers of energy accounting for some 32 percent of the total consumption. Households plus commercial users, the transportation sector, and electric utilities have each generally accounted for slightly more than 20 percent of total consumption.

The major sources of energy in the U.S. have changed over time. Initially coal dominated the scene but with the emergence of the diesel locomotive, the demand for coal was seriously reduced. Oil became the leading source of energy but, given recent concerns with the environment, the market position of natural gas has greatly improved. Presently, nuclear power appears to be a possible replacement of oil and gas as the major source of energy.

B. Energy sources—market structures

To appreciate the changing nature of interfuel competition, some knowledge of the market structures associated with the individual fuels is a necessity.

(1) *Petroleum.*—The market structure of this industry is extremely complicated. Functionally the industry includes: (a) exploration and production of crude oil, (b) transportation, (c) refining and processing, and (d) distribution and marketing.

Gasoline and other fuels for internal combustion engines account for approximately 50 percent of refined products, the remainder composed of middle distillates and residual fuels for boiler use. A small, although increasingly significant amount of crude production is used as an input in the production of petrochemical and chemical products.

The industry is composed of both major and independent firms. While the distinction is not precise, major firms are nearly always integrated through all stages while independents usually operate at a single stage in the production process.[4] Most independents are involved in crude oil production and must rely on the majors for pipeline and refinery services.

There are upwards of 8,000 firms engaged in the production of crude oil; most of which sell their production at the wellhead to the major firms. The top 4 firms account for about 22 percent of total production; the top 8 for 35 percent; and the top 20 for 50 percent of total crude production. While most producers are not integrated, the integrated firms are clearly the dominant force in the industry. In 1950, they accounted for about 60 percent of net production.[5]

Though concentration levels appear to be relatively low, crude production does not take place in a competitive setting. In fact, the oil industry represents an outstanding example of an industry characterized by ineffective competition. The production of crude oil is basically a cartel, supported by direct and pervasive government controls. Direct controls include (a) production controls by the major producing States, and (b) the imposition, at the Federal level, of mandatory controls on the importation of foreign crude oil.

As mentioned above, vertical integration is a common characteristic of major petroleum companies. While vertical integration per se does not create market power, if it encompasses a production stage where competitive forces are weak, competitive problems can arise. Specifically, integration can serve as the "carrier" of economic power between production stages. In the oil industry, integration allows the firm to choose the point at which excess profits will be taken.[6]

At the refining stage, concentration has increased to the point where the top 4 firms control 33 percent of domestic capacity, the top 8 account for 57 percent, and the 20 largest control about 84 percent of natural refining capacity. In addition there is some evidence of a trend towards higher concentration.[7] In any case, the concentration values do not accurately reflect the true concentration level. They are based upon a national market, and, in many respects, the refining market is regional in scope.

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[4] For a comprehensive analysis of the petroleum industry and an assessment of the competitive effects associated with vertical integration, see De Chazeau and Kahn, *Integration and Competition in the Petroleum Industry*, (New Haven: Yale University Press, 1959).

[5] U.S. Senate, Subcommittee on Monopoly and Antitrust, *Economic Concentration*, pt. 2, pp. 594–5.

[6] The retail gasoline market serves as an example. Independent gasoline marketers find it very difficult to compete against the majors because of the advantage that accrues to the major (integrated) firm from monopoly profits earned at the crude stage.

Professor Bain's research indicates the existence of substantial entry barriers, mainly due to large capital requirements facing potential entrants. Vertical integration has been significant in raising such capital requirements for entry.

(2) *Coal.*—Up to the early years of the twentieth century, coal was the major fuel in the United States. Since that time, coal has declined in both its relative and absolute importance.

(a) *Grades of coal.*—Coal is not a homogenous product. On the basis of certain physical properties,[8] coal is classified as: (a) anthracite, (b) bituminous, (c) sub-bituminous, and (d) lignite. (Bituminous coal is, by far, the most important of the four types.) It is interesting to note that the cost of production does not appear to determine the quality of the final product.

All coal except coking coal is used for the single purpose of combustion to produce heat. Coking coal, often described as metallurgical coal, is used principally in the production of steel where, in addition to providing heat, it performs a chemical and physical function. As a result, steam coal and coking coal are not ready substitutes, and coking coal does command a substantially higher price in the market.

To a large extent, the history of the U.S. coal industry can be explained by four factors: (a) easy entry in the early days of the industry due to low capital requirements, (b) the importance of transportation costs in the final product price and federal legislation to control railroad rates, (c) a highly immobile labor force and consequently low wages, and (d) lack of research and development in the industry. Recent events in the industry have altered some of these factors—but the present structure of the industry is still related to these four items.

(b) *Composition of demand.*—Before noting the specific aspects of structure, it is necessary to note the turbulent changes in consumption patterns. One source of demand, the railroad locomotive, virtually disappeared by 1960. In addition, the retail market for coal fell from a level of 100 million tons, equivalent to 23 percent of total steam coal consumption, in 1947 to around 18 mililon tons, less than 5 percent of the total, in 1967. The abrupt decline in the retail market was mainly due to the substitution of natural gas and fuel oil for coal for home heating purposes. At the same time, industrial demand has also declined. In percentage of total consumption, industrial use was between 32 percent and 36 percent of the total in the 1947–1958 period. Thereafter, the percentage declined to about 25 percent in 1967.

On the other hand, the electric utility industry has been a source of substantial increase in demand for coal. Utilities consumed 86 million tons, or 20 percent of the total, in 1947 but by 1967 consumption reached 272 million tons, accounting for 70 percent of total steam coal consumption.[9]

(c) Progressiveness of the industry.—The ability of the coal industry to furnish the needed supplies of coal to satisfy the demands of electric utilities stems mainly from a very impressive record during recent years in technological innovations in the production, distribution, and marketing areas.[10] As a result productivity has increased fast enough to offset rising wage costs.

Since 1947, productivity in underground mining has tripled, rising from 5 tons per man day in 1947 to about 15 tons per man day in 1967. At the same time, productivity more than doubled in strip mining over the same period, moving from 15 tons per man day in 1947 to 35 tons per man day in 1967. The importance of the more productive strip mine in the industry has increased. In 1947, 22 percent of total production came from strip mines, but in 1967 the comparable figure was 34 percent.[11]

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[7] During the period 1951–63, 27 independent refineries, each with capacity in excess of 10,000 barrels per day, have disappeared. Their total capacity amounted to 8 percent of the domestic capacity in 1957. Independent refiners are caught in a profit squeeze—they buy crude oil from a market where prices are monopolistically high due to a cartel and sell the refined product, gasoline, in a highly competitive market. U.S. Senate, Subcommittee on Antitrust and Monopoly, "Testimony of Alfred Kahn," *Economic Concentration*, Pt. 2, p. 592.

[8] Included are age, volatility, carbon content, and heat content measured in British Thermal Units.

[9] While utility demand has "saved" the coal industry, it should be noted that, in the competition for fuel demands of electric utilities, the *relative* position of coal to other fuels has declined. In 1947 and 1948, coal had 75 percent of this market; in 1949–1960 between 65 percent and 70 percent; and since 1960 a constant 65 percent. The decline was due to greater shares going to oil and, in particular, to natural gas.

[10] Among the more important innovations are: (1) the introduction of the continuous miner method in 1958, (2) increased use of lower cost strip mining, (3) the unit coal train concept, (4) use of low cost water transportation method, and (5) the generation of electricity at the mouth of the mine.

(d) Concentration levels.—Because of the importance of transportation costs in the price of coal, markets have regional boundaries and, accordingly, concentration levels computed on a regional basis are likely to understate true concentration levels.

In a comprehensive study of the coal industry, Professor Reed Moyer has delineated the boundaries of the mid-western coal market.[12] His study indicates that, in 1962, the top four firms accounted for 55 percent of total production and the top eight controlled 75 percent of the total.[13] These levels are sufficient to insure that sellers recognize their interdependence in decision-making. The study also reveals a significant trend towards higher concentration in the midwestern market. Compared to the concentration figures reported for 1962, in 1934, the top four firms controlled slightly less than 20 percent of total coal production and the top eight controlled 30.4 percent of total production. Moyer concludes:

> The net effect of this trend has been to create an oligopolistic market struccomposed of medium- to large-sized firms, each sufficently large to make its market adjustments felt by its competitors.[14]

It should be noted that his conclusions apply only to the mid-western market.

Traditionally, low entry barriers have been cited as the reason for instability in the coal industry, but several factors suggest that present entry barriers may be somewhat higher. The necessity to obtain much larger reserves, and the use of much larger mining equipment have combined to raise entry capital requirements. In addition, the production cost differential between strip coal and deep coal[15] as well as the increasing use of long-term supply contracts[16] have also contributed to higher entry barriers.

Special entry problems are associated with emergence of "captive" coal mines (i.e., mines owned and operated by large users of coal). Two effects are generally attributed to the existence of captive mines: (a) by eliminating a sizeable coal customer from the market, the remaining commercial operators face a thinner market, and (b) captive mine operators have been quicker to reach agreements in labor disputes and less willing to resist wage demands.[17]

(e) Entry lags.—Entry into coal mining involves very lengthy time requirements. Entering on a *de novo* basis requires the acquisition of significant reserves, involving a time period of at least 4 or 5 years. Similar time lapses are often involved in negotiating a sales contract. Combining these steps with the time required to bring a mine into production could involve 2 to 10 years.[18]

(f) Economies of scale.—There is evidence of scale economies in the production of coal. Professor Moyer has compared productivity, measured as tons produced per man-day, for both underground and strip mines in the mid-west.[19] Plant economies are evident in underground mining up to an annual production of 500,000 tons; beyond this size there are few additional economies. A different pattern exists in strip mining, productivity advances appear to continue as mine size increases. Limits do exist on the optimum size of the strip mine; diminishing returns appear when production occurs a considerable distance from the preparation plane. In spite of such scale economics, optimum size plants appear to account for small percentages of total output.[20]

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[11] FTC Docket 8765, Kennecott Copper Corporation, p. 31.

[12] Reed Moyer, *Competition in the Midwestern Coal Industry,* (Harvard Press, 1964).

[13] *Ibid.*, p. 68.

[14] *Ibid.*

[15] Profits in the industry may be high but entry deferred, if the only reserves to entrants available are deep coal which necessitates more expensive methods of production. In this case, entry would not be profitable.

[16] Presently, some coal companies have a large proportion of their sales locked into long term contracts; while these contracts have price escalation clauses, price increases have not kept pace with prices in the spot market causing profits of these companies to lag the profits of companies with a smaller proportion of sales via long term contracts: *Forbes*, Oct. 15, 1970, p. 80.

[17] James Hendry, "The Bituminous Coal Industry" in Adams, *The Structure of American Industry*, 3rd edition, p. 80.

[18] Professor Fox concludes a period of 10 to 12 years will elapse between the time a firm decided to enter and the time it becomes a substantial competitor. FTC Docket 8765, Kennecott Copper, p. 45.

[19] Moyer, *Competition in The Midwestern Coal Industry,* (Harvard Press, 1964) pp. 106–8.

[20] *Ibid.*, p. 108.

(g) Excess capacity.—In the past, the coal industry has been plagued by excess capacity. Several factors are often cited as causes of the problem. The demand for coal is seasonal. During periods of high demand, firms have entered, but once demand falls there is little tendency for firms to exit the industry. One possible explanation is that there are significant costs associated with maintaining an idle mine and, in addition, a mine may be kept idle for only about two years, beyond that time corrosion and water damage are likely to force abandonment of the mine. Hence, partial production is preferred over a complete cessation of production. As a result, the supply of coal has been inelastic. Traditionally, capacity adjustments upward have been smoother than downward adjustments during periods of declining demand.

During the 1919–23 and 1945–50 periods, substantial amounts of excess capacity appeared in the industry. In both cases, the excess capacity developed as a partial response to wartime price controls in the prior years which made expansion unprofitable.[21]

While the industry has been plagued with excess capacity in the past, presently a problem of too little production appears to exist. Whether the inelastic supply schedule is due to an increase in entry barriers or because of domination of coal production by oil firms is a major question as yet unanswered.

(h) Exports.—Coal exports, of which 66 percent is coking coal, have increased some 61 percent since 1961, rising from 34.9 million tons in 1961 to 56.2 million tons in 1969. This increase is mainly due to a high demand for coking coal from Japan's steel industry. Export to Japan rose from 6.6 million tons in 1961 to 21.4 million tons in 1969—an increase of 223 percent.[22]

(i) Prices.—Table 4 presents evidence of price trends over the 1959–1969 period for bituminous coal.

While an upward trend is apparent, the data in Table 4 understates the extent of the increase. The greatest increase in prices has occurred in the spot market—the market where coal is sold on a daily basis rather than on a contract basis. Although not presented in the Table, price increases of 30–50 percent were instituted in the first half of 1970.

(j) Major coal producers.—Petroleum companies have invested heavily in the coal market and by 1969 accounted for nearly 25 percent of total production from noncaptive mines. Oil company interest in coal is heightened by changes in technology which have tended to bring oil and coal into direct competition[23] but, perhaps most important, is the potential of producing synthetic gasoline and crude oil from coal.

(3) *Natural gas.*—The natural gas industry encompasses three groups: (1) producers, (2) pipeline companies, and (3) distribution companies. This memo is mainly concerned with the producing segment of the industry. Producers are involved with exploring for, developing, and producing natural gas in the field.

The production segment developed in close association with the oil industry, which is not surprising since natural gas and oil are often found together and produced as joint products. Gas had little economic value until the 1930's when pipeline construction allowed long distance transmission to areas of high population density. The leading producers are the major integrated petroleum companies.[25]

(a) Seller concentration.—In measuring concentration levels past research has generally relied on sales of natural gas by the largest producers to interstate pipelines. Table 9 indicates the percentage of sales accounted for by the top 4, top 8 and top 20 firms during the 1961–68 period.

While care must be exercised in interpreting this data, a trend toward higher seller concentration is indicated.[26] The data reported in Table 9 contains several weaknesses. In the first place, interstate sales figures cannot be considered as analogous to national production because intrastate sales of natural gas are omitted. Although the exact size of the intrastate market is unknown, the Federal Power Commission estimates these sales to be about one-third of the total national market. Others have placed the figure at closer to 40 percent. Omitting these sales may be of considerable importance since scattered evidence indicates that in the Texas intrastate market, seller concentration is higher than in the national market.[27]

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[21] James W. Meehan, *Market Structure and Excess Capacity: A Theoretical and Empirical Analysis*, (Boston College: Unpublished Ph.D. Dissertation), 1967.

[22] Standard and Poor's, *Industry Survey*.

[23] The changing nature of interfuel competition is discussed below.

[25] The leading producers for 1961, 1965, and 1968 are identified in Table 8.

[26] Similar data has been presented by Cookenboo for 1955. At that time, the top 4 accounted for 22.8 percent of sales, the top 8 accounted for 35.1 percent, and the top 20 accounted for 53.7 percent of total sales to interstate pipeline. See Leslie Cookenboo, Jr., *Competition in the Field Market for Natural Gas* (Rice Institute Pamphlet, Vol. XLIV, January 1958), p. 48.

Another serious weakness exists because the concentration data assumes a national market. That the market boundaries are national is supported by the development of a vast pipeline system, but this must be viewed against the backdrop of emerging direct competition between gas and other fuels and the existence of significant intrastate markets. If the true market is regional, concentration ratios computed on a national basis will tend seriously to understate true concentration levels.

Perhaps the most appropriate measure would be based upon the extent to which natural gas reserves are controlled by the dominant firms in the industry. Such data is crucial in judging the likelihood of competitive performance in the future. Once again, this type of data is not as yet available.

(b) Buyer concentration.—Evidence of the concentration levels on the buyers' side of the market is present in Table 10. The evidence suggests a slight trend toward lower concentration levels for the four largest and eight largest buyers over the 1961–68 period.

The measures of buyers' concentration are subject to the same criticisms described above in the case of seller concentration. However, an initial direct comparison indicates higher concentration levels on the buyers' side of the market.

(c) Monopoly or monopsony.—The issue of whether the natural gas producing industry is characterized by monopoly or monopsony power has received and continues to receive the attention of economic researchers. Professor Paul MacAvoy has concluded that ". . . gas markets were diverse in structure and behavior, and were generally competitive or were changing from monopsony towards competition." [28] This conclusion applies to markets prior to 1960. Equally important, are two studies by Cookenboo [29] and Neuner [30] covering the same time period as MacAvoy's work—but employing different methodology. Both generally conclude that the evidence provides little support to a claim of monopoly in natural gas field markets.[31]

(d) Entry conditions.—Little evidence is available on entry conditions, but an initial assessment of the industry suggests that capital requirements constitute the major source of the barriers. Scale economies and product differentiation advantages do not appear to present major obstacles to new entrants.

Capital requirements are large for two reasons. One, in the Southern Louisiana area, the Federal Government leases acreage for drilling purposes. Leases are sold on a bonus-bid basis rather than on a royalty-bidding scheme. The bonus method increases the size of the initial investment required, whereas the royalty method would minimize the size of the initial outlay. Because of the large investments required by the bonus system, smaller firms are likely to find entry rather difficult.[32] Two, the use of long-term contracts between producers and pipelines have raised capital requirements for new entrants. These contracts, necessary for FPC certification of the pipeline, require that a producer be able to commit a volume of proved gas reserves sufficient to satisfy the pipelines need for upwards of 20 years. As a result, the producer must accumulate sizeable reserves, requiring large investment outlays, before any production can be initiated and marketed.

Often suggested in the literature is that the market structure in the natural gas producing industry has been, and continues to be, mainly determined by the various types of contracts employed between producers and pipelines.[33] At various times, these contracts have had clauses allowing price escalation, tax sharing, and price renegotiation. However, the most important aspect is probably the duration of the contracts. There seems to be general agreement in the literature that pipelines would be satisfied with shorter contracts.[34]

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[27] It should be pointed out that sales in the Texas market, an intrastate market, do not fall under FPC jurisdiction. How this affects concentration levels in the regulated markets is an interesting, but as yet unexplored question.

[28] Paul W. MacAvoy, *Price Formation in Natural Gas Fields: A Study of Competition, Monopsony, and Regulation* (New Haven: Yale Press, 1962), p. 265.

[29] Leslie Cookenboo, *Competition in the Field Market for Natural Gas* (Rice Institute Pamphlet: No. 4), January 1958.

[30] Edward J. Neuner, *The Natural Gas Industry* (University of Oklahoma Press, 1960).

[31] *Ibid.*, p. 245.

[32] Supporters of the present system claim the bonus bid method creates an incentive for early production while the royalty technique would increase the ability of the company to keep the lease unproductive.

[33] Resources for the Future, Inc., *U.S. Energy Policies: An Agenda for Research* (John Hopkins Press, 1968), p. 54.

(e) Summary.—Measures of concentration from both the buyer and seller sides in the natural gas producing industry are available, but they cannot readily be used to judge the likelihood of competitive performance. Available evidence does suggest a trend toward higher seller concentration. While estimates of entry conditions are imprecise, capital requirements appear to constitute the main source of entry barriers.

4. *Nuclear power.*—Nuclear power, from a public policy viewpoint, is unique among the various fuels. Its development has been basically due to federal action associated with military projects during World War II. To this date, policy has been concerned with delineating the extent to which nuclear power development should be separated from federal control and allowed to enter the competitive sector of the economy. In contrast, other fuels had their beginning in the private sector, and the policy issue was to what extent should government regulation be allowed, not to what extent deregulation should be practiced as in the case of nuclear power.

(a) Trend away from Federal control.—A clear trend away from Federal Control and towards a greater reliance on market forces exists in the area of nuclear energy. However, some Federal involvement will always exist due to the issues of security and safety associated with nuclear fuels.

A reading of the Atomic Energy Commission Act indicates clearly that Congress intended market forces to guide the development of nuclear energy. Specifically, this legislation indicates that the use and control of atomic energy is (a) "to be directed so as to make the maximum contribution to the general welfare" and (b) "to strengthen free competition in private enterprise." [35]

(b) The nuclear power plant.—Nuclear power is a young but rapidly expanding industry. Nuclear generation of electricity is expected to develop rapidly in the 1970's. Forecasts by the AEC predict that by 1980 145,000 Mwe of nuclear power will be installed in the U.S. out of a total generating capacity of 580,000 Mwe.[36]

A nuclear power plant is composed of (a) the reactor system and (b) the generating system. The reactor system serves the same purpose as a steam boiler in a conventional fuel generating station, but the technology is very different. In the nuclear plant, heat is produced by nuclear fission and transferred by a coolant and ultimately used to create steam which drives a turbine. The generating system in a nuclear plant is the same as in a conventional power plant.

A comprehensive study of competition in the nuclear power supply industry has been completed and presented to the Atomic Energy Commission and Department of Justice.[37] In the report, the nuclear power plant is broken into four divisions.

(1) *Assemble Reactor System* (ARS)—reactor, steam generator, control and radiation instrumentation, pipes, valves, etc.

(2) *Nuclear Fuel Core* (NFC)—fabricated fuel elements (the end products of uranium mining and milling), conversion, and enrichment.

(3) *Turbine generators*—conversion of steam into electrical power.

(4) *Balance of plant*—engineering and construction services, site cost, etc.

In 1968 the cost of the entire package, assuming a capacity of 1,000 megawatts, was approximately $160 million. Of this amount, the reactor system accounts for 30 percent, the initial fuel core for 20 percent,[38] and the turbine for about 22 percent, with the remaining 28 percent attributed to balance of plant.

Capital costs of construction have increased at a fast rate. Assuming 1,000 megawatts capacity, a plan scheduled for commercial operation in mid-1975 and mid-1976 is estimated to cost from $246 million to $265 million, respectively.[39]

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[34] The use of warranty contracts, involving no commitment of specific reserves but only the guarantee of delivery, supports this assertion.

[35] Atomic Energy Act, Section 105.

[36] Assuming the forecasts are correct, this would create annual domestic sales of some $5 billion in the nuclear power supply industry. USAEC, Division of Operations Analysis and Forecasting, "Forecast of Nuclear Power Growth," Wash. 1084, December 1967.

[37] Arthur D. Little, Inc., *Competition in the Nuclear Power Industry* (Washington: Government Printing Office, 1968). Also see: U.S. Atomic Energy Commission, *The Nuclear Industry*, 1970, Washington, D.C., 1970.

[38] While initially the four parts have roughly similar dollar values, the fuel cycle becomes a much more significant and dominant cost over time because fuel is needed for installed as well as new reactors. Other expenditures are mainly one-time outlays.

[39] U.S. Congress, Joint Committee on Atomic Energy, *AEC Authorizing Legislation FY 1971*, Washington, Mar 11, 1970. Pt. 3, pp. 1476–1478.

While costs of nuclear steam supply and turbine equipment have increased, the escalation is mainly due to higher construction, equipment, and labor costs.[40] At the same time, capital costs for a coal-fueled plant of the same capacity have increased, but at a slower rate. As a result, light water reactor nuclear plants are estimated to cost about 25 percent more than fossil plants for 1975–76 operations.[41]

(c) Turnkey sales.—During 1964–65, many sales of nuclear power plants were made by General Electric and Westinghouse on a turnkey basis—components sold as a package, assembled, and made operational by the successful bidder. General Electric and Westinghouse offered those packages at extremely low prices, and by 1968 each had suffered losses in excess of $100 million on such sales. Industry charges of deliberately low pricing to eliminate competitors and forestall entry were levied against the firms. There is little doubt that their sales policies did reduce competition. In 1954, some 20 firms were heavily engaged in reactor research and development; by 1959 the number was halved, and by 1968, only four firms were manufacturing cost-competitive reactors. General Electric's and Westinghouse's combined market shares reached a peak during 1964–1965, but following the elimination of turnkey sales, their share decreased to about 70 percent in 1967–68.

Their dominant position in the reactor market appears to be safe due to high entry barriers. And this position becomes more important in light of their extensive integration into the other phases of the industry.

(d) Nuclear fuel cycle.—The nuclear fuel cycle includes (a) exploration, mining, and milling of uranium, (b) conversion of yellow cake (U_3O_8) to uranium hexafluoride (UF_6), (c) fuel fabrication, and (d) manufacture of zirconium tubing.[42]

This memo will be mainly concerned with the mining and milling of uranium. Table 11 presents evidence of sales, number of firms and level of seller concentration at the fuel cycle. In 1968, some 15 companies [43] were engaged in mining and milling uranium, with the four largest accounting for approximately 60 percent of the total.[44] There is some recent evidence to suggest that significant entry has occurred at the different parts of the fuel cycle.[45] The Arthur D. Little study also indicates the industry's optimism about future demand for uranium. Sales are expected to rise from $107 million in 1970 to some $563 million by 1980, an increase of 426 percent.

By criteria, the most important development at the fuel stage has been the strong position attained by petroleum firms. Kerr-McGee controls about 27 percent of domestic uranium capacity and is the largest single producer of uranium in the U.S.[46] Humble Oil is planning a mill with capacity equal to 8 percent of domestic capacity in 1970.[47] Other large mills are planned by Continental Oil Co. and Amarillo Minerals, Inc (Pioneer Natural Gas).[48] Evidence presented by the Atomic Energy Commission indicates that in 1970 oil companies presently held about 45 percent of known uranium reserves and that 21 oil companies, not presently engaged in uranium mining and milling, account for about 31 percent of total uranium exploration drilling in 1970.[49]

While the petroleum companies have a strong position at the mining phase, they face some competitors. Evidence indicates that the major reactor suppliers, with one exception, are planning to enter, or have already entered, into uranium ore exploration and mining. Babcock and Wilcox has not entered this phase, but Combustion Engineering, General Electric, Gulf, General Atomic, and Westinghouse are either in the fuel cycle area or are potential entrants.[50] In addition, United Nuclear, an independent fuel fabricator, has a major position in uranium mining and milling.

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[40] *Ibid.*

[41] *Ibid.*

[42] In recovering uranium from the basic ore several steps are involved. Initially, the ore must be converted to the oxide from U_3O_8. This material is then converted to gaseous form uranium hexafluoride (UF_6), which, when enriched, increases the percentage of the fissionable U–235. The enriched gas is then reconverted into a form suitable as a fuel, usually another form of uranium oxide (UO_2), which is fabricated into fuel elements. Arthur D. Little, Inc., *Competition in the Nuclear Power Supply Industry* (Washington, 1968), p. 29.

[43] Actually there were some 110 additional companies whose combined output was equal to only 8 percent of the total. Because of their size, the ADL report omitted these firms. *Ibid.*, p. 32.

[44] A depletion allowance of 22 percent can be applied to the recovery of uranium. It can be applied at either the mining or milling stage. Since the milled ore (yellow cake) is a higher value product, the incentive exists for the mining firm to integrate forward and produce yellow cake from its own uranium ore. Thus, the depletion allowance may act as a force for futher vertical integration in the fuel cycle; similar situations exist in the oil industry.

[45] U.S. Atomic Energy Commission, *The Nuclear Industry, 1970,* Washington, 1970.

[46] Netschert, Gerber, and Stelzer, p. 28.

[47] *Ibid.*

[48] *Engineering and Mining Journal*, McGraw-Hill, March 1970, p. 94.

[49] U.S. Atomic Energy Commission, *The Nuclear Industry, 1970,* Washington, 1970, p. 41.

There is a serious lack of information about the structural characteristics of uranium mining. Concentration data based on reserve ownership, rather than production, is preferable but not available. Little information is available about cost and productivity levels at either mining or milling stage. Capital requirements and technological changes in uranium mining have received little attention in the literature.

In the past, the only market for uranium has been the Federal Government. While these purchases were spread over some 25 companies, the top 4 (Anaconda, Atlas, Kerr-McGee, and Union Carbide)[51] supplied about 51 percent of the total U_3O_8. Government purchases are to be terminated in 1970.

Significant uranium discoveries, or their development from previously known reserves, were reported in 1969 by major petroleum firms including Pennzoil United, Humble Oil, Standad Oil of Ohio, Amerada, and Gulf Oil. The importance of petroleum firms in the mining of uranium is highlighted by the following statement in a leading trade journal: "Petroleum companies dominated the field of new discoveries . . ."[52] Nearly all large oil firms are either actively engaged in or planning to enter the mining and processing stage.

Besides being involved in domestic mining activities, Gulf Oil, Standard of N.J., Phillips and Kerr-McGee are actively engaged in searching for uranium in foreign countries. While oil companies are heavily engaged in the fuel cycle part of the nuclear power supply industry, they do face substantial competition from some of the country's largest firms.

(e) Summary.—The mining and milling phase of the nuclear fuel cycle is concentrated with the top four firms accounting for some 60 percent of total production. The basic change in the industry has been the emergence of petroleum firms into this phase of the cycle.

C. Competition in the energy sector

History indicates that competitive rivalry between the different fuels has been intense. The steady decline of coal's dominant position since the 1930's, the emergence of oil, the spectacular rise of natural gas, and the emergence of nuclear power all give evidence to the existence of competitive forces. Presently, synthetic fuels produced from coal and nuclear fuels threaten to erode the market position of the fossil fuels.

Evidence indicates that changes in fuel use and transportation technology have heightened the degree of interfuel competition.[53] In addition, environmental concerns, creating pressure for a clean fuel, have been responsible for recent shifts in fuel use.

(1) *Boiler Fuel Market.*

(a) Electric utility market.—In the electric utility market, coal, oil, natural gas, and uranium oil serve the same purpose: to produce heat used to generate steam which drives the turbines. For many years, fuel choice was solely determined by relative prices of the various fuels. Presently, electric utilities are giving careful consideration to the physical characteristics of each fuel before selecting a specific fuel.

Coal's relative position in this market has been eroded because of its handling properties and because it creates significant air pollution. On the other hand, oil and natural gas have made substantial gains in this market. There can be little doubt that the environmental issue will continue to precipitate further substitutions for switching coal unless a more efficient method of removing stack emissions is discovered.[54]

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[50] *Ibid.*, p. 160.

[51] *Ibid.*, p. 33.

[52] *Engineering and Mining Journal, op. cit.*, p. 92.

[53] William Vogely has identified revolutionary technological change in the consuming sectors or in the transportation of energy as the most important source of increased interfuel competition. Wm. A. Vogely, "Pattern of Energy Consumption in the U.S. 1947–65 and 1980 Projected," Papers presented at World Power Conference, Tokyo: October 1966, pp. 5–10. Examples of such revolutionary technological changes would include: (a) the introduction of the diesel locomotive; (b) the growth of the high pressure natural gas pipeline network, made possible by the innovation of high pressure, large diameter seamless pipe; (c) the growth of extra-high-voltage transmission lines; and (d) the development of coordinated electric power grids in the U.S.

[54] Detroit Edison recently announced plans to convert from coal to gas at four of its plants: See *Coal News*, September 1969, p. 42.

While oil and gas have reduced coal's position, uranium, as a source of nuclear power, threatens to reduce their position as a boiler fuel in the electric utility market. The advantage of nuclear generation lies in its ability to provide low cost electricity without creating air pollution. While public acceptance of nuclear generating stations has been slow because of problems of thermal pollution and safety fears, there appears to be little question of ultimate acceptance.

The Atomic Energy Commission estimates that by the year 2000, more than 50 percent of generating capacity will be nuclear.[55]

Thus, competition in the electric utility boiler market indicates an increasing degree of interfuel competition. While price was once the sole determinant of demand, environmental concerns are becoming more important and will continue to affect the choice of fuel.

(b) Nonutility.—Outside of the utility market, the choice of boiler fuel has often been based on such nonprice factors as cleanliness, convenience, and comfort.[56] As in the case of the utility market, environmental factors have fostered fuel substitution. In the case of domestic heating, oil and natural gas have virtually eliminated coal.

(c) Fuel substitutability.—The above discussion centers around the idea of an increasing degree of substitutability between the various fuels in the boiler fuel market, in both the utility and nonutility areas. Changes in the degree of substitutability, or cross-elasticity of demand, is a crucial factor in understanding recent developments in the energy area. Unfortunately, little specific knowledge is available, but one study indicates that in the midwestern coal market area, 64 percent of the installed electric generating capacity was capable of fuel interchanges.[57]

(2) *Nonboiler fuel market.*—Similar increases in fuel substitutability have occurred in this market. While coal, oil, and natural gas compete with each other, coal faces a distinct disadvantage because it presents more difficult handling problems than the fluid or gaseous fuels. Oil and gas also face significant competition from electricity in this market.

Evidence of increasing interfuel competition can be seen from the various promotional schemes adopted by electric utilities and gas companies. In particular, electric utilities have promoted the total electric home, where all energy needs, including heat, are supplied by electricity. In the early 1950's few homes were heated electrically, but by 1968 over 3 million homes utilized electric heat. This reflects the entrance of electricity into a market previously supplied by petroleum companies. By capturing all energy needs in the home, the relative price of electricity is lowered enabling electricity to compete successfully with the oil and gas alternatives. In addition, the promotional scheme effectively reduces the likelihood of the homeowner switching to these alternatives. In short, the "all electric" home concept, by reducing fuel substitutability, may go a long ways to reduce interfuel competition.

In a similar manner, gas companies have promoted the "all gas" concept for such complexes as shopping centers, apartment houses, the office buildings. In these cases, gas is even used to generate electricity. Both the "all electric" and the "all gas" concept[58] represent attempts to reduce the customer's willingness and ability to substitute fuel sources. Such programs tend to support the position that market boundaries have been widened resulting in increased interfuel competition.[59]

(3) *Implications of present R&D activity for future interfuel competition.*—To a large degree, greater interfuel competition is due to basic technological changes in the energy-consuming sectors of the economy and to advancements in energy transportation. Present R&D activity indicates the likelihood of even more revolutionary changes in the production and transportation of energy and greater interfuel competition in the future.

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[55] U.S. Congress, Joint Committee on Atomic Energy. AEC Authorizing Legislation Fiscal Year 1971, Washington: Mar. 11, 1970, Pt. 3, p. 1161.

[56] A study by the Bituminous Coal Institute for 1956 revealed that in every city studied outside of the gas-producing areas, fuel oil and gas prices exceeded coal prices, yet the changeover to oil and gas continued. A similar pattern was observed in sales by retailers to commercial and industrial users. Bituminous Coal Institute, Comparative Fuel Costs, 1958, reported in Reed Mayer, *Competition in the Midwestern Coal Industry* (Howard Press, 1964), p. 49.

[57] Mayer, *op. cit.*, p. 57.

[58] Total energy is equally feasible with oil. While no industry organization presently exists to promote oil as a total energy fuel, there are signs of such a development in the near future.

[59] Additional proof comes from the increased ownership of gas distribution companies by electric utilities.

One innovation, the fuel cell, would be a direct source of competition to electricity. In fact, this innovation has the potential of virtually eliminating the electric utility industry. The fuel cell generates electricity via a flameless oxidation process. Presently, the fuel cell is not cost-competitive with electricity, but additional cost reductions could bring it into direct competition with other fuels, especially electricity.[60] In response to the potential competition posed by the fuel cell, it would appear that the electric utility industry must continue to reduce the costs of electricity if it is to preserve cost advantage over the fuel oil.

The production of synthetic oil and gasoline from coal or oil shale would result in direct competition with refined gasoline and crude oil. Only small cost reductions are needed to make synthetic fuels commercial.[61] Again, as long as the development of the synthetic fuels is not controlled by oil and gas firms, significant potential competition does and can exist and can act as a restraint on competitive actions of existing oil and gas companies.

The commercial development of the fast breeder nuclear reactor would be an additional source of interfuel competition in the future. Essentially this type of reactor produces more muel than it consumes in the generating process. Introduction of these reactors is expected by 1990–2000. Once it becomes operational, the demand for mined uranium will be reduced and utilities will be able to sell the excess nuclear fuel produced by the fast breeder reactor. This new source of fuel is expected to be very cost competitive with conventional fuel.

The generation of electricity by the process of magneto-hydrodynamics (MHD) would provide economical generation of large amounts of electrical power.[62] The absence of moving parts in the MHD generator promises to produce much higher energy conversion efficiencies. At the present time, the most efficient fossil-fueled generating stations have an efficiency of only some 40 percent and nuclear stations are currently at the 32 percent level.

All of these items would bring about revolutionary technological changes in the energy area and, if past experience is correct, foster greater interfuel competition.

(4) *Summary.*—Developments in the energy area indicate an increasing amount of interfuel competition. Evidence indicates that market boundaries, defined in terms of the degree of substitutability between fuels, may have changed towards a wider market, namely, an energy market. These changes, per se, indicate an increase in the level of competition. However, recent developments in the energy area permit some skepticism that the potential for greater competition has actually been realized.

(5) *Role of competition in intermediate goods markets.*—The essence of economic competition is that resource allocation choices are made by separate and independent decision-making units. The importance of maintaining effective competition in the energy sector is not adequately demonstrated by simply indicating that monopoly power leads to prices set above opportunity costs.[63] Primary importance in the case of energy stems from its location in the economic process—namely a consumed intermediate good.

Economic theory demonstrates that price distortions flowing from market power at such an intermediate stage lead to greater losses than would a similar degree of market power located in a final goods market.[64] Monopolistically high prices for an input, such an energy, would be transmitted to all users of the product and, in turn, cause them to reduce their use of the input. As Kaysen and Turner state:

> . . . departures from a competitive resource allocation in markets located further back in the productive process have an amplified effect through the distortions introduced into the resource allocation of the buying industries.[65]

Any price distortion in the intermediate goods price is transmitted by the price system to all users, leading to a greater so-called "public welfare" loss. In contrast, market power in a final goods market leads to price distortions and allocative inefficiency, but the effects are limited to a single market and adjustment to the higher price is limited to the consumer.

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[60] The development of a commercial fuel cell by 1975 is the goal of a group of gas companies described as TARGET (Team to Advance Research for Gas Energy Transmission).

[61] For example, present technology allows the production of gasoline from coal at a cost of only 1–2¢ per gallon above the present cost of refined gasoline.

[62] The technology involves an MHD generator, in which there are no moving parts. Basically, the kinetic energy of expanding gas is converted into electrical energy by utilizing a magnetic field.

[63] When prices exceed opportunity costs, some users, or potential users, are willing to pay more for an increase in output than the real cost of generating that increase. This describes the economic meaning of an inefficient allocation of resources.

[64] I. M. D. Little, *The Price of Fuel* (Oxford, 1953), "Introduction."

[65] Carl Kaysen and Donald Turner, *Antitrust Policy: An Economic and Legal Analysis,* (Harvard University Press), 1965, p. 33.

For the reasons described above, if a choice must be made, it is arguably far more important to devote resources to maintain effective competition in intermediate goods markets than in consumer goods industries. This argument certainly applies to the energy sector, but, in addition, there is another reason why maintaining competition in the energy sector is so crucial. Not only is energy an input product, but it is a basic input used by all industries. Hence, the effects of market power will be felt in all industries, although to different degrees depending on the relative importance of energy in the industry's production function, and inefficiencies in resource allocation will occur in all industries.

(6) *The energy company—development of.*—Another dramatic development in the energy sector is the emergence of the so-called "energy company"—a company with substantial holdings and operations in all energy sources. No longer do firms limit their activities to a single fuel.

As developed in an earlier section, interfuel competition has increased greatly in recent years. The creation of energy companies might well be an attempt by the oil companies to eliminate the emerging competition between the various fuels.

From the viewpoint of the firm, the creation of an energy company is a logical response to increasing interfuel competition. Given an increase in the ability of users to shift from one energy source to another, the firm operating in a single fuel area is extremely susceptible to shifts in demand due to price and/or nonprice factors. In the past, when the ability and/or willingness to shift was lesser, the single fuel firm was relatively safe from market forces.

Today's energy company is basically a transformed petroleum firm. Oil companies, already heavily involved in natural gas production, have undertaken vast expansion plans resulting in important reserve positions in all fuels. The extent of oil company involvement in other fuels is not fully known, but some indication is available from the evidence presented in the following table. This table understates, to some degree, the extent of oil company involvement in the nuclear area since it omits company plans to enter production and processing of nuclear fuels such as thorium and plutonium.

OIL COMAPNY INVOLVEMENT IN OTHER FUEL AREAS, 1969

Energy source	Number of companies with active or planned production	Companies with positions	Total
Oil shale	3	14	17
Tar sands	3	13	16
Coal	7	9	16
Uranium	6	18	24

Source: L. C. Rogers, "Oil-finding pours into broad minerals drive," "Oil and Gas Journal," Feb. 24, 1969, p. 37.

While the evidence presented in this table does not indicate the extent of oil company involvement in other energy sources, it clearly indicates the diversification pattern of the oil companies. Additional information of this type is presented below in Table 12. This table provides a more comprehensive picture of the transformation of oil companies into energy companies.

Clearly, oil companies are engaged in the uranium area.[66] As discussed earlier, the complete fuel cycle of the nuclear power industry encompasses several distinct operations. For eight large petroleum firms, Table 13 indicates their involvement at different points in the complete fuel cycle.

Oil company entry into the coal market [67] can be seen from the data contained in Table 14. It indicates coal leases held by oil companies on public land. In addition, the estimated value of the coal reserves is presented. It should be pointed out that, since Table 14 is limited to holdings on public land, the full extent of coal holdings by oil firms is not revealed.

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[66] Oil company control of domestic uranium reserves was recently placed at 80% by a leading trade journal. *Oil and Gas Journal*, Mar. 1, 1971, pp. 19–20.

[67] Oil company control of coal reserves is about 20% of domestic reserves: *Oil and Gas Journal*; Mar. 1, 1971, pp. 19–20. This figure appears to be somewhat low.

(7) *Competitive significance of events in the energy area.*—In the energy area, two developments stand out: (a) an increased degree of substitutability between the various fuels, caused to a large extent by revolutionary technological change in the energy consuming sectors of the economy and in energy transportation methods, and (b) the transformation of oil companies into energy companies. Both events have important implications for competition between the energy sources.

The significance of the former is that, by bringing products, previously in separate markets, into direct competition with each other, market power held by a firm in a specific fuel tends to be eroded to some degree. Ralph Nelson, in a comprehensive analysis of concentration trends, discovered the existence of an inverse relationship between market size and concentration level.[68] In short, the emergence of an energy market, per se, implies an increase in competition.

However, the development of the energy company could offset the procompetitive effect of wider market boundaries. While the type of evidence needed to test this hypothesis is not readily available,[69] economic reasoning is clear as to the possibility.

The interaction of these two forces can be illustrated by the use of a numerical example. Table 15 lists three separate products: A, B, and C. Assume that these products are not ready substitutes, i.e., they belong to separate economic markets. Two additional assumptions are necessary: (1) the top 4 firms in each industry are different, and (2) each industry's output is 100 units. Table 15 indicates the physical output produced by each of the top four firms in each industry. In each market the top 4 produce 60 units. Hence, the concentration is 60% in each market.

In order to demonstrate the procompetitive effects of a wider market, assume that the products are good substitutes for each other—in place of three separate markets there is a single economic market, as appears to be the case in energy. Again, assume that the dominant firms in each product are different. In this case, the largest firm in the wider market is the top firm in Product B with 40 units of output, in a similar manner, the top producer (30 units) of B would be the second ranking firm in the wider market. Collectively, the top four would produce 110 units with industry output being 300 units (sum of A+B+C). The point to be made is that concentration is now 37%, whereas it was 69% in the first example. The emergence of a wider market led to a reduction of concentration—a procompetitive effect.

However, to achieve the above result requires the assumption that different sets of firms supply the three products. If this is not the case the results of a wider market is drastically altered. To emphasize this point, assume that the 4 top firms are the same in each product. In this case, in the wider market the top 4 would produce 180 units and concentration would be 60 percent, the same level as existed before the change in market boundaries.[70]

Clear implications for maintaining competition in the energy area flow from this example. If the dominant oil companies also become the dominant suppliers of alternative energy sources, the procompetitive effects associated with increased interfuel competition will not be realized. To capture the benefits of competition, merger policy, of course, must prevent the dominant oil companies from establishing similar positions in the other fuels. The exact position of the oil companies in the other fuels is not known and will be very difficult to ascertain, regardless of the methods employed to obtain the information. While the full competitive effects associated with the energy company are not known, it is clear that one very important effect has been to reduce the number of separate decision-making units among the energy suppliers, leading to a centralization of decision making.

The impact of this centralization on R&D activity, inventive activity, and rate of innovation is of crucial importance in regards to future levels of interfuel competition. Present research activity gives much evidence of further revolutionary technological changes in the production and transportation of energy.

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[68] Applying his results to energy, a broadening of market boundaries would increase the size of the market and lead to a lowering of concentration. Ralph Nelson, *Concentration in the Manufacturing Industries of the U.S.*, (Yale Press, 1963), pp. 46–48.

[69] The specific information would include (a) exact quantification of oil company holdings in the alternative fuels, and (b) the holdings of non-oil companies in these fuels.

[70] Even if the top 4 firms were the same in each product line but had different ranks, the effect would be the same—concentration would not fall to the level (37%) it did when firms were dominant in only one product line.

These developments will determine the future competitive positions of the individual fuels. The crucial factor is the extent to which the growth of energy companies has centralized the decision-making power over R&D activity in competing fuels in the hands of the oil industry. Can the energy company be expected to perform R&D activity in a different manner [71] than if the firms were operating in a single fuel area?

While the evidence is incomplete and, in some cases, contradictory some reliable evidence exists to indicate that petroleum firms have performed somewhat better in the area of invention and innovation than other manufacturing firms.[72] The basic question is whether, given increasing oil company control of all energy sources, the research and development program which best serves the commercial interests of the energy company also best serves the public interest.

(8) Summary.—Two developments in the energy area stand out: a) substantial increase in interfuel competition, due, to a large degree, to revolutionary changes in the technology of energy production, distribution and use; and b) the emergence of energy companies as the result of a series of oil company acquisitions.

From these developments flow two specific public policy questions. One, exactly what are the market boundaries in the energy area and what types of mergers are involved, i.e., horizontal or conglomerate? Two, will the mergers, by centralizing control over R&D activities in other fuels in the hands of oil companies, significantly affect long run interfuel competition?

D. Study plan

The Bureau of Economics is proposing a study aimed at investigating the competitive implications associated with the development of the energy company in the U.S. economy. It should be pointed out that, while several government-initiated studies of the energy area have been proposed, none, to our knowledge, is directly aimed at assessing the competitive effects associated with the energy company.

Listed below are areas to be studied which the Bureau of Economics believes can be handled with its available resources—and are necessary and vital to any merger enforcement effort contemplated by the Commission.

(1) *Market boundaries.*—In assessing competition, one of the tasks is to arrive at the appropriate market definition, both in terms of product lines and geographical area. This memo contends that market boundaries have undergone substantial change in the energy area. It appears that the individual fuels are directly competing with each other or that the market definition has evolved from being a coal or oil market to an energy market. If correct, the result is a much larger market with an increased number of products in direct competition with each other.

An initial investigation into this question indicates that market boundaries probably can be established from public data sources. Good information on fuel substitutability in the electric utility area is available from the National Coal Association [73] and the Edison Electric Institute.[74] In addition, fuel use, by economic sector and presented on a state-by-state basis, is available from the Bureau of Mines.[75]

(2) *Oil company acquisition.*—The proposed study will attempt to determine the nature of the mergers. They may be viewed as either conglomerate or horizontal depending upon the market definition. If separate fuel markets exist, they are basically conglomerate; on the other hand, if an energy market exists, these mergers are horizontal in nature.

In addition, the study will determine the impact of the acquisitions on concentration levels.[76]

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[71] An example: The merger of Continental Oil and Consolidation Coal involves an acquisition by an oil firm of the coal company leading in the race to produce synthetic oil from coal. How this will affect the intensity of the R&D activity is the crucial question.

[72] Traditionally, economists distinguish between invention and innovation or the premise that an invention has little or no economic significance until it is applied. Evidence of inventive and innovative activity in petroleum can be found in: Edwin Mansfield, *The Economics of Technological Change*, (Norton & Co., 1968), pp. 24, 28, 108–110.

[73] National Coal Association, *Steam-Electric Plant Factors, 1968 ed*, Washington, D.C., 1968.

[74] Edison Electric Institute, *Statistical Year Book*, New York, 1969.

[75] U.S. Bureau of Mines, *Supply and Demand For Energy in the United States By States and Regions, 1960 and 1965*, Bureau of Mines Information Circular No. 8434, Washington, D.C., 1970.

[76] Concentration data will be based upon production figures. Data based upon reserve ownership would be extremely difficult to obtain and involve a large commitment of legal resources, with only a small probability of being successful.

(3) *R&D activity.*—There is little doubt that future levels of interfuel competition will be greatly influenced by the outputs of present R&D programs. How the series of oil company acquisitions involving coal and uranium mining firms will affect the intensity and output of these R&D programs is a crucial question.

With present resources, the Bureau of Economics can identify the competitive implications flowing from the centralization of energy R&D activity in the hands of energy companies.

However, to obtain the data necessary to evaluate the theoretical possibilities a much larger resource commitment would be required. A 6(b) questionnaire would be required as well as a substantial commitment of legal resources to insure a meaningful response. This process can be anticipated to be both costly and time-consuming.

If obtained, the data could provide some answers to a very vital question. To be candid, however, the probability of successfully obtaining such data is not high without the major commitment of legal resources referred to above.

(4) *Summary.*—The proposed study focuses upon the competitive implications associated with the development of the energy company—a company with significant holdings and operations in each of the energy sources. This will be accomplished by relating the energy company to (1) inter-fuel competition and a possible change in market definition, (2) the nature of the oil company acquisitions, i.e., whether conglomerate or horizontal, and (3) research and development activity.

The Bureau of Economics recommends that the Commission give highest priority to such a preliminary market boundary economic study of the energy area.

TABLE 1.—CONSUMPTION OF ENERGY RESOURCES BY MAJOR CONSUMER GROUP, 1963, 1965, AND 1967

Consumer group	Percent distribution		
	1963	1965	1967
Total	100.0	100.0	100.0
Household and commercial	22.3	21.1	22.1
Industrial	32.7	32.6	31.7
Transportation [1]	24.1	23.6	23.8
Electric generations, utilities [2]	19.5	20.6	21.9
Miscellaneous	1.5	1.0	0.5

[1] Includes military transportation.

[2] Represents outputs of hydropower and nuclear power converted to theoretical energy inputs at prevailing rate of pounds of coal per kwhr at central electric stations using 12,000 Btu per pound coal.

Source: Bureau of Mines; "Mineral Yearbook," from "Statistical Abstract 1969," 510.

TABLE 2.—ENERGY CONSUMPTION IN THE UNITED STATES PER CAPITA AND PER DOLLAR OF GNP [1]

[In thousands and Btu]

Year	Per capita energy consumption	Consumption per dollar of Btu
1947	228,132	106.1
1952	233,872	92.6
1957	244,878	96.2
1962	256,173	89.8
1967	297,543	87.3
1969	325,102	90.2

[1] GNP is measured in 1958 dollars.

Source: Bruce Netschert, Abraham Gerber, Irwin Stelzer, "Competition in The Energy Markets," testimony before Subcommittee on Antitrust and Monopoly, May 1970.

TABLE 3.—SPECIFIC ENERGY SOURCES AS PERCENTAGES OF TOTAL ENERGY CONSUMPTION[1] 1920–68

[In percent]

Year	Coal[2]	Oil	Natural gas, dry	Natural gas, liquids	Electricity	
					Hydro	Nuclear
1920[3]	78.4	15.3	4.2	0.2	3.9	0
1925	70.4	22.2	5.8	.6	3.3	0
1930	61.2	27.6	8.8	1.1	3.5	0
1935	55.7	30.4	10.3	.9	4.3	0
1940	52.4	32.1	11.4	1.0	3.8	0
1945	50.7	32.3	12.6	1.5	4.7	0
1950	37.8	36.0	18.0	2.3	4.7	0
1955	29.3	39.9	23.1	3.0	3.8	0
1960	33.2	38.2	28.3	3.2	3.6	.1
1965	23.0	39.6	30.0	3.5	3.8	.1
1968	21.3	39.7	31.3	3.7	3.8	.2

[1] Consumption is expressed in terns of Btu's.
[2] Bituminous, lignite, and anthracite.
[3] Totals may not equal 100 due to omission of exports and imports of oil.

Source: Bureau of Mines, "Mineral Yearbook," vols. I-II, various years.

TABLE 4.—BITUMINOUS COAL PRICES, 1959–69

Year	Average value at mine[1]	Freight	Wholesale	
			Mine run	Prepared sizes
1959	4.77	3.45	5.22	7.73
1960	4.69	3.40	5.16	7.69
1961	4.58	3.40	5.03	7.54
1962	4.48	3.32	4.92	7.53
1963	4.39	3.26	[2] 4.75	[2] 7.01
1964	4.45	3.11	4.80	6.90
1965	4.44	3.13	4.79	6.93
1966	4.54	3.01	4.95	6.96
1967	4.62	3.00	5.22	6.80
1968	4.67	3.01	5.40	6.94
1969	5.50		6.05	7.49

[1] Average price at mines includes the value placed on coal at the mines for all grades.
[2] Not strictly comparable with prior data.

Sources: Bureau of Mines and Bureau of Labor Statistics.

TABLE 5.—OWNERSHIP AND OTHER DATA ON 10 LARGEST COAL GROUPS

[Excluding steel company captive mines and companies producing primarily for steel industry]

Coal company	Ownership	Acquisition date	1968 Production[1] thousands of tons	Percent of industry production[2]
Consolidation group	Continental Oil Co	September 1966.	59,885	12.4
Peabody group	Kennecott Copper Corp	March 1968	59,811	12.4
Island Creek group[3]	Occidental Petroleum Corp	January 1968	32,927	6.8
Pittson group			19,793	4.1
United Electric Coal Cos., and Freeman Coal Mining	General Dynamics	Pre-1952[4]	13,055	2.7
Eastern Associates	Eastern Gas & Fuel Association		12,916	2.7
Westmoreland			11,623	2.4
Old Ben	Standard Oil Co. of Ohio	August 1968	9,923	2.1
Ayrshire	American Metal Climax	November 1969	9,254	1.9
Pittsburg & Midway	Gulf Oil Corp	September 1963.	9,250	1.9
Total			238,437	49.4

[1] Bituminous and lignite.
[2] Based on an industry total of 484,000. This total excludes 61,000 of captive production by the steel industry, since captive companies are exluded from the table. However, the production figures for individual companies may include some production for the steel company market.
[3] Excludes Maust coal and coke, which was acquired by Occidental in March of 1969.
[4] Main holdings apparently acquired in a merger with Electric Boat in 1952, but percentage ownership increased in 1963 and in 1966 (to 100 percent).

TABLE 6.—ESTIMATED COAL PRODUCTION IN 1967–70

[Tons in thousands]

	1967		1968		1969		1970, estimated	
	Tons	Percent of total production	Tons	Percent of total production	Tons	Percent of total production	Tons	Percent of total production
Oil companies [1]	102,586	18.4	104,974	19.3	114,067	20.4	120,360	[2] 20.4
Steel companies [3]	59,084	10.7	59,412	10.9	60,444	10.8	63,720	[2] 10.8
Electric utilities [4]	12,973	2.3	13,747	2.5	14,707	2.6	15,340	[2] 2/6
Other industries [5]	89,141	16.1	89,185	16.4	89,954	16.0	94,400	[2] 16.0
Total	262,784	47.5	267,318	49.1	279,172	49.8	293,840	49.8

[1] Consolidation Coal Co. (Continental Oil), Island Creek Coal Co. (Occidental Petroleum), Old Ben Coal Corp. (Standard Oil of Ohio), and Pittsburgh-Midway Coal Co. (Gulf Oil).

[2] Estimated production of group assuming 1969 percentage and 590,000,000 tons total production in 1970.

[3] Includes United States Steel, Bethlehem, Republic, Jones & Laughlin, Armco Steel corporations, and others.

[4] Includes American Electric Power Corp., Duquesne Light Co., Southern Electric Generating Co., Alabama Power Co., and West Penn Power Co., and others.

[5] Includes Kennecott Copper Co., General Dynamics Corp., American Metal Climax, Inc., Allied Chemical Corp., Union Carbide Corp., and others.

Source: "U.S. Coal Production by Company," compiled and published by Keystone Coal industry manual, McGraw-Hill, Inc.

TABLE 7.—OIL COMPANY INVOLVEMENT IN COAL INDUSTRY

Oil company	Coal interest
1. Ashland Oil Co	Major interest in Arch Minerals—coal.
2. Atlantic Richfield	Acquired coal rights—extensive acreage.
3. Continental Oil	Owner of Consolidation Coal Co.—largest in United States.
4. Gulf Oil (GGA)	Owner of Pittsburg-Midway Coal Co.—large holding in Midwest.
5. Humble Oil & Refining Co	Extensive holdings in Midwest coal fields.
6. Occidental Pet	Acquired Island Creek Coal Co.—third largest coal producer in United States.
7. Shamrock Oil Co	Acquired Pickens Mather Coal Co. through Kiamond Shamrock.
8. Sun Oil Co	Owns extensive resources.
9. Texaco	In Western Germany, etc.
10. Kennecott Copper	Owns Peabody Coal Co.—second largest coal producer in United States
11. Ling Temco-Vought, Inc	Owns Jones & Laughlin Steel and coal producer.
12. General Dynamics	Freeman Coal & United Electric Coal Cos.
13. American Metal Climax, Inc	Owns Ayshire Colleries.
14. Zapatco	Owns Barnes & Tucker Coal Co.
15. Standard Oil Co. Ohio	Owns Old Ben Coal Co. & Enos Coal Co.
16. Kerr-McGee	Owner of Substantial Coal Reserves, producing coking coal from a field in Oklahoma.

Source: Hearings, Subcommittee on Antitrust and Monopoly Senate Committee on Judiciary (1967), updated to Jan. 27 1969.

TABLE 8.—LEADING FIRMS RANKED BY SALES TO INTERSTATE PIPELINES, 1961

Producer	Percent of total	Cumulative, percent
Phillips	7.9	7.9
Pan American Petroleum Corp	5.5	13.5
Humble	4.3	17.8
Shell	3.8	21.6
Texaco	3.3	24.9
Socony Mobil	2.7	27.6
Gulf Oil	2.7	30.2
Atlantic	2.2	32.4
Superior Oil	2.1	34.6
Sinclair Oil & Gas	2.0	36.5
Union Producing	1.9	38.5
Union Oil of California	1.9	40.4
Sun Oil	1.9	42.3
Cities Service	1.9	44.2
Champlin Oil & Refining	1.7	45.9

TABLE 9.—SALES BY PRODUCERS TO INTERSTATE PIPELINES, 1961–68

Year	Percent of sales accounted for by—		
	Top 4	Top 8	Top 20
1961	21.6	32.4	53.0
1962	21.5	33.9	54.6
1963	21.6	34.4	56.0
1964	22.1	35.9	57.6
1965	23.2	37.7	59.8
1966	23.9	38.6	61.6
1967	24.4	40.1	61.5
1968	25.4	41.8	63.1

Source: Sales volumes obtained from: Federal Power Commission, "Sales by Producers of Natural Gas to Interstate Pipeline Companies," various years.

TABLE 10.—PURCHASES OF NATURAL GAS BY INTRASTATE PIPELINES, 1961–68

Year	Percent of purchases accounted for by —		
	Top 4	Top 8	Top 20
1961	45.2	63.5	93.5
1962	45.3	60.8	90.4
1963	42.4	60.1	90.8
1964	42.5	60.1	90.9
1965	40.5	59.1	90.8
1966	38.7	58.0	91.5
1967	39.1	58.6	92.3
1968	38.5	58.6	92.5

Source: Federal Power Commission.

TABLE 11.—SIZE, NUMBER OF FIRMS, AND DEGREE OF SELLER CONCENTRATION: FUEL CYCLE COMPONENT OF NUCLEAR POWER SUPPLY INDUSTRY

	Estimated annual U S. sales [In millions of 1967 dollars]			Active U.S. companies,[1] 1968	Percent [2]
	1970	1975	1980		
Fuel cycle:[3]					
U_3O_8	107	292	563	15	60
Conversion to UF_6	13	35	67	3	100
Enrichment	120	358	714	[4] 1	100
Fabrication	48	175	405	5	97
Reprocessing	3	30	100	3	100

[1] Excludes companies shown as announced firm plans or project under study; also excludes foreign companies.

[2] Approximate market share, top 4 participants, 1968.

[3] Annual market volumes include initial cores and reload. Annual demand for fuel cycle product runs approximately one-third to one-fifth of the first core.

[4] U.S. Atomic Energy owned plants.

Souce: Arthur D. Little Co., Report to Atomic Energy Commission and Department of Justice, "Competition in the Nuclear Power Supply Industry," Washington: U.S. Government Printing Office, 1968, p. 63.

TABLE 12.—DIVERSIFICATION IN THE ENERGY INDUSTRIES BY THE 25 LARGEST PETROLEUM COMPANIES, RANKED BY ASSETS, AS OF EARLY 1970

Petroleum company (1)	1969 assets (thousands) (2)	Rank in assets (3)	Energy industry: Gas (4)	Oil shale (5)	Coal (6)	Uranium (7)	Tar sands (8)
Standard Oil (New Jersey)	$17,537,951	1	X	X	X	X	X
Texaco	9,281,573	2	X	X	X	X	X
Gulf	8,104,824	3	X	X	X	X	X
Mobil	7,162,994	4	X	X	X	X	X
Standard Oil of California	6,145,875	5	X	X	----	----	
Standard Oil (Indiana)	5,150,677	6	X	X	----	----	
Shell	4,356,222	7	X	X	X	X	X
Atlantic Richfield	4,235,425	8	X	X	X	X	X
Phillips Petroleum	3,102,280	9	X	X	----	X	
Continental Oil	2,896,616	10	X	X	X	X	
Sun Oil	2,528,211	11	X	X	X	X	X
Union Oil of California	2,476,414	12	X	X	----	X	
Occidental [1]	2,213,506	13	X	----	X	----	
Cities Service	2,065,600	14	X	X	----	X	X
Getty [2]	1,859,024	15	X	X	----	X	
Standard Oil (Ohio) [3]	1,553,591	16	X	X	X	X	
Pennzoil United, Inc	1,356,832	17	X	----	----	X	
Signal	[4] 1,258,611	18	X	----	----	----	
Marathon	[5] 1,221,288	19	X	X	----	----	
Amerada-Hess	982,157	20	X	----	----	X	
Ashland	846,412	21	X	X	X	X	
Kerr-McGee	667,940	22	X	----	X	X	
Superior Oil	494,025	23	X	X	----	----	
Coastal States gas producing [4]	490,190	24	X	----	----	----	
Murphy Oil	343,914	25	X	----	----	----	

[1] Includes Hooker Chemical Co.
[2] Includes Skelly and Tidewater.
[3] Includes reported British Petroleum assets.
[4] As of June 30, 1969.
[5] As of Sept. 30, 1969.

Source: Col. (2) "Moody's Industrial Manual," June 1969, and 1969 annual reports.

TABLE 13.—INDICATED PRESENT OR FUTURE CAPABILITY OF OIL COMPANIES, EITHER DIRECTLY OR THROUGH SUBSIDIARIES, IN THE NUCLEAR FUEL CYCLE

Company	Exploration or reserve holdings	Uranium mining and milling	UF_6 conversion	Fuel preparation or fabrication	Fuel reprocessing	Reactors
Standard Oil (New Jersey)	X	X	----	X	----	
Gulf	X	----	----	X	X	X
Atlantic Richfield	X	----	X	X	X	
Continental	X	X	----	----	----	
Getty	X	X	----	X	X	
Standard Oil (Ohio)	X	X	----	----	----	
Kerr-McGee	X	X	X	X	X	
Sun	X	X	----	----	----	

TABLE 14.—PUBLIC LAND COAL LEASES HELD BY OIL COMPANIES IN THEIR OWN NAME OR MAJOR KNOWN SUBSIDIARY, AS OF AUGUST 1970 [1]

Company	Number of leases	Number of acres leased (acres)	hstimated coal leased (million short tons)
Atlantic-Richfield	17	37,423	643
Belco Petroleum Corp	1	4,551	48
Carter Oil Co	3	15,491	164
Concho Petroleum	10	8,595	106
Consolidation Coal Co	16	37,892	715
Gdlf Oil	1	540	8
Kerr-McGee	6	15,427	253
Seneca Oil Co	1	6,336	93
Sun Oil Co	1	14,680	155
Total	56	140,935	2,185

[1] Does not include Colorado, data for which is not available.

Source: New York State Public Service Commission.

TABLE 15.—IMPACT OF CHANGING MARKET BOUNDARIES ON CONCENTRATION LEVELS

Firm rank	Separate markets A	Separate markets B	Separate markets C	Single market Different firms [1]	Single market Same firms [2]
1	20	40	30	40	90
2	20	10	10	30	40
3	10	5	10	20	25
4	10	5	10	20	25
Top 4	60	60	60	110	180
Total output	100	100	100	300	300
CR_4 (percent)	60	60	60	37	60

[1] The dominant firms in product A are not dominant in product B, etc.
[2] Each firm has the same rank in each product line.

TABLE 16.—LEADING FIRMS RANKED BY SALES TO INTERSTATE PIPELINES, 1965

[In percent]

Producer	Total	Cumulative
Humble Oil	6.4	6.4
Pan American Petroleum	6.1	12.5
Phillips	5.9	18.4
Shell Oil	4.8	23.2
Gulf Oil	4.1	27.3
Socony Mobile Oil	4.0	31.3
Texaco	3.2	34.5
Continental Oil	3.2	37.7
Union Oil of California	2.7	40.4
Sinclair Oil & Gas	2.6	43.1
Atlantic Refining	2.2	45.3
Superior Oil	2.1	47.4
Sun Oil	2.1	49.5
Union Products	1.7	51.2
Cities Service Oil	1.6	52.8

TABLE 17—LEADING FIRMS RANKED BY SALES TO INTERSTATE PIPELINES, 1968

[In percent]

Producer	Total	Cumulative
Humble Oil	8.6	8.6
Pan American Petroleum	5.9	14.5
Gulf Oil	5.7	20.2
Phillips	5.2	25.4
Shell Oil	4.8	30.2
Mobil Oil	4.2	34.4
Texaco	4.1	38.5
Union Oil	3.3	41.8
Continental Oil	3.0	44.8
Sinclair Oil & Gas	2.2	47.0
Sun Oil	2.0	49.0
Alberta & So. Gas Co	1.9	50.9
Superior Oil	1.8	52.7
Cities Service	1.8	54.4
Atlantic Richfield	1.8	56.2

Exhibit 4.—Letter From Commissioner Larson, AEC, Concerning the Availability of Uranium Production and Reserves

U.S. Atomic Energy Commission,
Washington, D.C., September 11, 1973.

Hon. Philip A. Hart,
Chairman, Committee on the Judiciary Subcommittee on Antitrust and Monopoly, U.S. Senate

Dear Senator Hart: Chairman Ray has asked me to reply to your letter of August 8, 1973, concerning the availability of information on uranium production and reserves.

First, let me say that we are aware of and share with you your concern about the inadequacy of energy industry data. We agree that reserve and production data are particularly important, and we have developed such information on uranium since the early 1950's.

Much of the information has been supplied by the uranium industry on a voluntary basis with the understanding that proprietary information would not be divulged. This information has been made available to the public and to other Government agencies on a basis which did not identify proprietary information. Copies of recent publications based on such information are enclosed. In the case of the FTC study on Interfuel Substitutability in the Electric Utility Sector, information on uranium production by individual companies was provided with the permission of the companies involved. Although the question of reserves was discussed informally, with FTC, the matter was not pressed, and it was the staff's understanding that the information provided was adequate.

We have supplied information on the distribution and control of uranium resources within the limitations stated to various committees of Congress and Government agencies from time to time.

We are pleased to enclose the answers to your questions in the order listed.

If we can be of further assistance, please let us know.

Sincerely,

Clarence E. Larson, *Commissioner.*

Enclosures.

Questions and Answers

1. Question. What information does the AEC have on uranium and/or other fuel reserve ownership?

Answer. AEC has detailed information on the ownership of uranium reserves mine-by-mine and company-by-company. AEC has not made independent assessments of other fuel reserves.

2. Question. When, under what circumstances, and by what authority was this information obtained?

Answer. This information is obtained by analysis of basic data supplied voluntarily by each company.

3. Question. How was the accuracy of this data assessed?

Answer. The accuracy of the data is asessed by on-the-spot field checking, conferences with company personnel, and independent analysis.

4. Question. What strictures exist respecting use and disposition of this data, and why were they entered into?

Answer. The information with respect to any individual company is treated as proprietary and held within the AEC. This is an informal understanding on the basis of which the companies voluntarily supply the information. However, information compiled in a manner which does not disclose proprietary information is published regularly and supplied, when requested, to the Congress or to other Government agencies.

5. Question. What are the legal powers of the AEC respecting the collection of this type of information, e.g., does the AEC possess the power to compel disclosure of such information?

Answer. As indicated, information concerning ownership of uranium reserves has been acquired on a voluntary basis. Section 65 of the Atomic Energy Act of 1954, as amended, precludes the Commission's requiring reports with respect to any source material prior to removal from its place of deposit in nature.

Section 65 provides as follows:

"REPORTING.—The Commission is authorized to issue such rules, regulations, or orders requiring reports of ownership, possession, extraction, refining, shipment, or other handling of source material as it may deem necessary, except that such reports shall not be required with respect to (a) any source material prior to removal from its place of deposit in nature, or (b) quantities of source material which in the opinion of the Commission are unimportant or the reporting of which will discourage independent prospecting for new deposits."

6. Question. What are the AEC policies concerning the collection of such information?

Answer. In view of AEC's lack of authority to require reports concerning ownership of reserves, AEC policy concerning the collection of such information is to obtain it from the mining companies on a voluntary basis.

7. Question. What are the policies concerning the dissemination of such information to the public, to other regulatory agencies, and to the Congress?

Answer. The AEC policy is to make public as much data as possible without divulging proprietary information and to provide the information within this limitation, to Congress and other Government agencies.

8. *Question.* According to AEC information, what are the facts relevant to the specific FTC request described by Dr. Mann?

Answer. The problem of supplying proprietary information on reserves and production was discussed by AEC staff with Dr. Mann and other FTC staff. It was agreed that FTC would request the companies to give permission to AEC to provide certain production data or to supply the data directly to FTC. Most of the companies contacted acceded to the request and asked AEC to provide the data. It is our understanding that most or all of the remaining companies supplied data directly. FTC staff also explored with our Grand Junction, Colorado, Office means by which information on reserves could be obtained in a form useful to FTC but not compromising proprietary information. It is our understanding that the Grand Junction Office requested that FTC make an official request for the information it considered necessary to AEC Headquarters. To our knowledge, no such request was made.

Senator HART. Mr. Schwartz, I am advised that yesterday or last night a decision was made to give Dr. Ture an opportunity to testify today because of an engagement he had. We will hear him now.

Our next witness is Dr. Norman B. Ture, speaking for the Gas Supply Committee.

STATEMENT OF DR. NORMAN B. TURE, ON BEHALF OF THE GAS SUPPLY COMMITTEE

Dr. TURE. My name is Norman B. Ture, and I am appearing before this subcommittee on behalf of the Gas Supply Committee.

I am informed that the Gas Supply Committee was formed in 1965 for the purpose of seeking amendatory legislation with respect to natural gas producers. The Gas Supply Committee is sustained by contributions from natural gas producers and regularly files all required reports under the Federal Regulation of Lobbying Act.

In April 1973, I was requested by the Gas Supply Committee to prepare a study on competition in the natural gas producing industry. This study was undertaken for the purpose of presenting it in such congressional hearings as might be held during this term of Congress on proposals to amend the Natural Gas Act. Since the issue of competition in the natural gas producing industry and the relationship of that issue to the present shortage of natural gas is of interest to this committee, I am requesting that my study, "Competition in Natural Gas Production," be submitted for the record at this time. The materials I have submitted for the record and my oral testimony today are the products of my own independent research and analysis.

[For the study referred to see exhibit 1 at the end of Dr. Ture's testimony.]

Dr. TURE. The U.S. economy has experienced an increasing shortage of natural gas during the past few years, and this shortage threatens to become more serious in the years ahead. The central issue for public policy posed by this shortage is whether the FPC regulation of natural gas wellhead prices permits: (*a*) The efficient distribution of the existing supply of natural gas among purchasers, and (*b*) meeting longer term demands for gas.

One view is that the shortage is attributable to a lack of effective competition in the natural gas producing industry—this view is incorrect. Objective, rigorous analysis strongly urges that the natural gas producing industry is highly and effectively competitive, and the data pertaining to the industry's operations and market results unmistakably confirm this finding.

The gas shortage is not the outcome of a lack of competition in the industry. It is, rather, the product of FPC ceilings on gas prices set at levels below those which are necessary to clear the market.

Continued insistence on wellhead gas price regulation is equivalent to continued insistence on gas shortages. If the price of gas is not permitted to be determined in the market, it will be necessary to find some other means for determining which gas users will get how much gas. Any such non-price rationing would mean an inefficient distribution of gas supplies. It would also result in less of the economy's production resources being devoted to exploration, development, and production of gas than would be warranted by the value which would be placed on gas in an unregulated market. Regulated prices do not serve the present or future interests of consumers.

The central policy issue raised by the existing and prospective shortage of gas is whether any price for gas other than the unregulated market price will deal effectively with these shortages. Regrettably, this issue has been obfuscated by unfounded allegations that the natural gas producing industry is noncompetitive or monopolized. In fact, measured against the standard criteria for distinguishing between competitive and monopolistic industries, the natural gas producing industry must be characterized as highly and effectively competitive.

One of the principal conditions for perfect competition is that the industry in question consists of so large a number of companies that the actions of no one company has a significant influence on the price of the industry's product. Rigorous analysis regrettably affords no basis for determining the minimum number of companies required to satisfy this condition.

Data from various Government sources show a very large number of natural gas producers:

TABLE 1.—*Number of natural gas producers*

Data source and year—Federal income tax returns (1968):	
Corporation	3,218
Individual	35,738
Partnership	10,795
Census of Mineral Industries (1967)	5,482
Federal Power Commission (1971)	3,745

Despite the differences among these data sources with respect to the criteria for including companies in the population, even the minimum estimate shows a substantial number of producers.

A second condition for perfect competition is that companies in the industry act independently. The extremely large number of natural gas producers clearly precludes the possibility of effective combination among any significant number of them. In an unregulated market, the difficulties which would be met in efforts by any few gas producers to exert substantial control over any significant part of the total producer population boggles the mind.

Often cited as evidence to the contrary is the prevalence of so-called interties or interlocks. The terms refer to a variety of arrangements among producers to act jointly with respect to one or more aspects of bidding for leases, exploration and development activity, production, and so forth. These arrangements are made among a great many producers—among major and among smaller, independent producers. They are entered into with respect to domestic and foreign ventures and onshore and offshore leases. The company composition varies from arrangement to arrangement, with respect to both the identity of the companies and their shares in each arrangement. There is nothing furtive about these arrangements, nor is there evidence of concern by the producers participating in them over a widespread public knowledge of the arrangements.

No evidence has been presented to show that the so-called interties have reduced effective competition. On the contrary, these arrangements have facilitated rather than impeded competitive participation by producers other than the largest companies. If joint bidding were prohibited, it is unlikely that the smaller companies' financial resources would permit their effective participation in lease sales. As you know, smaller companies have indeed participated very effectively in lease sales.

To the extent that these arrangements reduce risk, they also reduce the cost of capital committed to additions to the supply of gas; hence, they increase rather than restrict gas supply. Insofar as small independents are included, the arrangements have the effect of expanding and diversifying their lease acquisition, exploration and production opportunities and capacity with respect to their capital resources. In every significant respect, interties and interlocks promote rather than inhibit competition among producers.

The widespread allegation that interties are evidence of collusive, noncompetitive behavior among producers is without foundation.

Another condition for perfect competition is that there is no significant barrier to the entry of new firms. Barriers to entry into an industry are generally thought to arise from one or more of a number of factors, such as exclusive control by existing companies of some essential production input or process, some minimum scale of plant required for at least marginally efficient operation, large capital requirements, some absolute cost advantages enjoyed by the existing companies, or highly effective product differentiation, whether of the physical characteristics of the product or merely subjective. None of these entry barriers is significant in natural gas production.

Let me add another potential entry barrier. In the theory of oligopoly, the longrun profit-maximizing strategy may be for oligopolistic companies to hold price at a depressed level in order to repel possible new entrants into the industry. In fact, in my judgment, the artificially low price of natural gas at the wellhead imposed by the regulatory process has had this effect. If prices were deregulated and if, in fact, the industry were oligopolistic, there would be very little by way of a price increase. On the other hand, if you firmly anticipate that if the industry were deregulated prices would go up, that would be some of the strongest evidence that you can find that the industry indeed is not oligopolistic.

The large number of gas producers furthermore provides evidence that there are no significant barriers to entry, either inherent in the market or enforced by collusive action by producers. From 1951 through 1963, the number of corporate returns filed by crude petroleum, natural gas, and natural gas liquid producers increased from 2,934 to 4,549. Thereafter, the number of returns declined to 3,218 for the taxable year 1968. Among proprietorships, the number of returns rose irregularly from 21,590 in 1957 to 35,738 in 1968, the most recent year available. The number of partnership returns has fluctuated within a much narrower range, from a low of 8,449 in 1959 to a high of 12,467 in 1965.

Moreover, growth in production and sales of the smaller producers is often spectacular. The performance record of the companies shown in table 2 in merely illustrative of a commonplace phenomenon in the industry.

[Table 2 follows:]

TABLE 2.—GROWTH OF SALES BY SMALL NATURAL GAS PRODUCERS TO INTERSTATE PIPELINE COMPANIES, 1961–71

	1971 sales (billion ft ^{3})	Increase since 1961 (percent)	Annual growth (percent)
An-Son Corp	9.5	[1] 239	[1] 27.7
Apache Corp	11.4	246	13.2
Isaac Arnold	34.5	1,465	31.7
Exchange Oil & Gas Corp	21.7	[2] 141	[2] 24.6
Imperial American Management	15.1	[3] 76	[3] 76.0
King Resources Co	17.4	[2] 545	[2] 59.4
MAPCO [4]	23.4	398	17.4
Midwest Oil Corp	11.6	300	14.9
Monsanto Co	42.3	386	17.1
Newmont Oil	10.4	316	15.3
ODECO [5]	38.9	925	26.2
Rodman Corp	32.6	[6] 782	[6] 98.5
Samadan Oil	12.6	425	18.0
Stephens Prod Co	39.3	293	14.7
TransOcean Oil, Inc.[7]	19.9	295	14.7

[1] Since 1966.
[2] Since 1967.
[3] Since 1970.
[4] Changed name from Producing Properties in 1964.
[5] Ocean Drilling & Exploration Co.
[6] Since 1968.
[7] Formed from operations of J. Ray McDermott Co. in 1968.

Source: Federal Power Commission, "Sales by Producers of Natural Gas to Interstate Pipeline Cos.," (1961–71).

Dr. Ture. Few of the major natural gas producers can match the growth record of the companies shown in table 2. And surely these data urge that neither the majors nor the industry structure in general pose any monopolistic impediment to the remarkable growth performance of these small companies.

These data strongly urge that both entry into and exit from natural gas production encounter no significant barriers. Indeed, the only major deterrent to expansion of the producer population in interstate gas is the artificially low price ceiling on gas imposed by FPC, which in turn unduly restricts the rate of return on investment in reserve additions.

Those who view the industry as noncompetitive point to the allegedly high proportion of total sales accounted for by a few companies as evidence of noncompetitive conditions. Neither the data pertaining to natural gas sales nor economic analysis support this conclusion. In the light of the basic characteristics of the industry, the data on sales concentration in no way challenge the view that the industry is highly and effectively competitive.

According to FPC data, the eight largest producers accounted for 41.8 percent of the total sales to interstate pipelines reported by producers to the FPC in 1968. In 1971, this share had increased slightly to 45.3 percent.

Among the top eight producers, the spread in market shares was relatively modest. In 1968, the largest producer's share was 8.6 percent, and the eighth largest producer's was 3.3 percent.

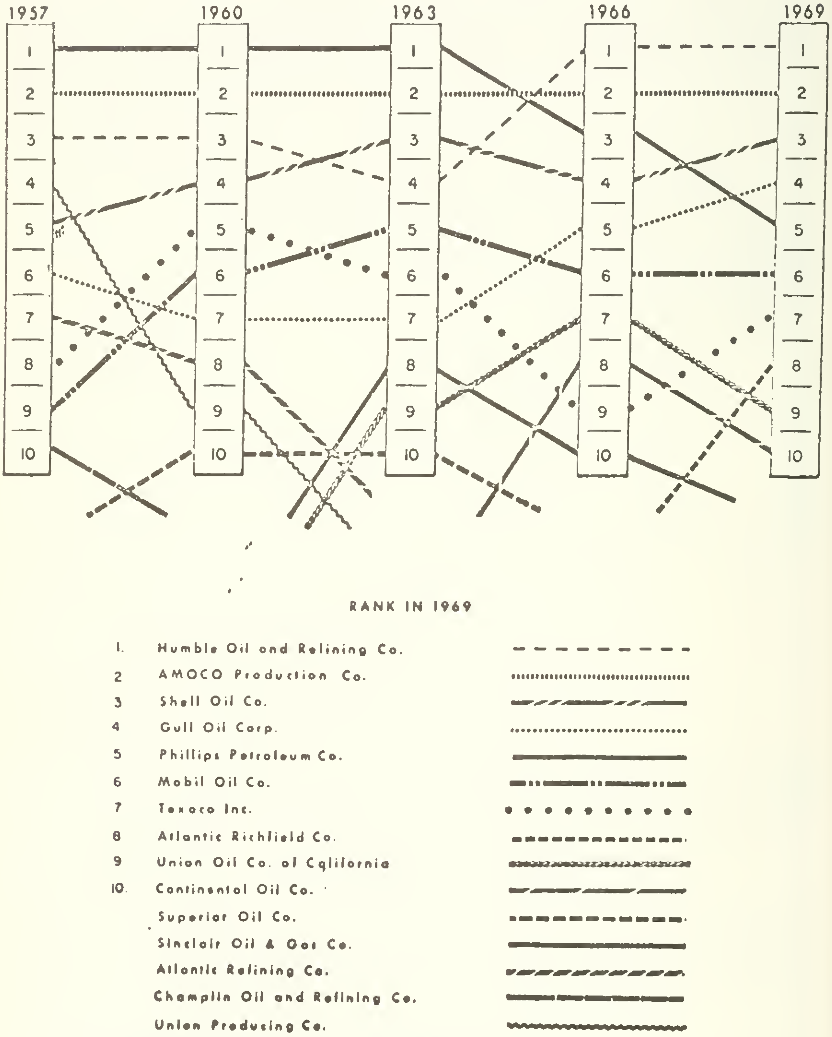
The market share rankings of gas producers change frequently: even among the major producers, market position changes materially within a short period of time. Figure 1 shows these changes in market rank from 1957–69. This shifting of rank in market shares clearly demonstrates that no one producer has the power to control or even materially to influence either total output or prices. It is also noteworthy that there is no correlation between size of company and interstate gas sales revenues. For example, the average revenue of the second four largest companies is somewhat greater than that of the first four.

[Figure 1 follows:]

FIGURE 1.

TURNOVER INDICATED BY CHANGE IN RANK AMONG THE TEN LARGEST SELLERS OF NATURAL GAS IN THE UNITED STATES

RANKING ON THE BASIS OF DELIVERIES TO INTERSTATE PIPELINES IN A GIVEN YEAR



SOURCE: Federal Power Commission, *Sales by Producers of Natural Gas to Interstate Pipeline Companies.*

Dr. TURE. To put the natural gas concentration ratios in perspective, they may be compared with the measures of concentration in manufacturing industries. The Census of Manufactures for 1967 shows that for all manufacturing industries the median concentration ratio was 48 percent. In other words, the natural gas producing industry is below the median level of concentration found in manufacturing. Out of a total of 412 industries, 213 or 52 percent had 8-firm concentration ratios of 46 percent or above.

A concentration ratio of 45.3 percent, as in the case of natural gas, clearly is not extraordinarily high. The natural gas production industry ratio ranks below—probably well below—that of at least half of the private sector of the U.S. economy. Even if, contrary to fact, these concentration ratios were meaningful measures of competitiveness, one would have to conclude that, at worst, the natural gas producing industry was more competitive than half of U.S. business.

Careful empirical investigations show no significant relationship between the degree of concentration and market prices. For example, a study by Richard Selden and Horace J. dePodwin comparing price changes with changes in concentration over the period 1953–59 shows that concentration explains only 1 percent of price changes and that within industry categories there is no relationship between price movements and degree of concentration. Moreover, the analytical connection between some measure of concentration and degree of competitiveness has not been established. And the conceptual validity and usefulness of the concentration measures which are typically used is questionable.

None of the conditions required for perfect competition demands that all of the firms in a perfectly competitive industry must be of equal size, for example, have an equal percentage of output and sales. It is an observable fact that company size varies in every industry, and that the distribution of companies by size has little if any relationship to industry competitiveness. Substantial variation in size is compatible with efficient operation, irrespective of the competitiveness of the industry.

One should expect, therefore, that even in the most nearly perfectly competitive industry, a relatively small proportion of the companies account for a disproportionately large proportion of sales. Data which show the proportion of sales by the top 4, 8, 20, et cetera, companies do not measure or describe industry competitiveness.

The notion that if there is some significant concentration of the sales in an industry the industry cannot be competitive appears to rest on the assumption that when a few firms account for a relatively large proportion of an industry's sales, they control the market, that is, can determine the total quantity sold and the price of the product. Concentration of sales, although a necessary condition, is not a sufficient condition for such control. To control market results, the major firms would also have to be able to prevent entry of new firms or expansion of output of other existing firms. The evidence is unmistakable that the major producers have no such power.

The measure of concentration most commonly used in the United States is the share of an industry's sales from the four, eight, et cetera, largest companies. The interpretation of these indexes as measures of competitiveness, however, is entirely ambiguous. For example, suppose that in industry A the first 4 companies account for 15 percent of sales and the next 4 companies for 10 percent, while in industry B, the first 4 companies' share is 14 percent and the next 4 have 12 percent. If the concentration ratio is measured by reference to the first four companies, industry A is less competitive than B; but if the first eight companies are used, industry B is less competitive. Would industry A or B be more or less competitive than industry C in which the largest company has 10 percent of total sales and no other company has more than 1 percent? Presumably, if the first 12, 16, 20, and 50 companies were alternatively used, the competitive rankings of the industries would change with each measure.

Given the narrow range of market shares among the major gas producers—as shown by the FPC data on sales to interstate pipelines—the lack of significant barriers to entry, the large number of producers, and the lack of significant product differentiation, it is difficult to believe that any one company could exercise any significant control in an unregulated natural gas market.

The existence of the unregulated intrastate market alongside the regulated interstate market, both supplied by producers selling in both markets, affords an opportunity to test the opposing propositions about the competitiveness of the gas producing industry. Surely if the industry is monopolistic or highly competitive its performance in the unregulated intrastate market should cast up evidence to this effect. In fact, however, such data as are available with respect to the intrastate market strongly affirm precisely the opposite conclusion: the industry is highly and effectively competitive.

Two separate tests, each solidly based on fundamental analytical propositions, are possible with the data available for the intrastate market. The first of these tests is a comparison of gas prices in the intrastate and interstate markets in given regions. Economic analysis leads to the conclusion that prices in the two markets should, in general, be quite close if the gas producing industry is highly and effectively competitive and if the FPC ceiling price is at least high enough to clear the market. If the industry, rather, is highly noncompetitive, substantial differences between the prices in the two markets should generally prevail.

For the period in the mid-to-late 1960's, prior to the sharply increasing shortages, intrastate prices were very nearly the same as interstate prices. In general, the difference between the prices in any given region was in the neighborhood of 1 cent per thousand cubic feet as shown in table 3.

[Table 3 follows:]

TABLE 3.—INTERSTATE AND INTRASTATE GAS PRICES IN CENTS PER THOUSAND CUBIC FEET, SELECTED REGIONS 1966–69

Region	1966		1967		1968		1969	
	Weighted average[1]	Range	Weighted average[1]	Range	Weighted average[1]	Range	Weighted average[1]	Range
South Louisiana:[2]								
Offshore interstate	19.29	17.00–19.50	20.18	18.50–24.00	20.66	18.50–21.25	21.05	19.50–22.25
Onshore interstate	20.42	13.30–21.25	20.64	15.00–21.25	20.91	17.50–22.00	21.21	17.50–22.75
Onshore intrastate	19.58	14.00–22.30	19.58	16.50–24.45	20.21	14.75–30.00	20.32	19.50–23.68
Texas Gulf Coast:[2]								
Interstate	15.59	12.00–17.00	15.70	14.25–17.00	16.89	14.25–17.80	17.71	14.00–21.25
Intrastate	16.10	11.00–18.00	17.47	10.00–20.00	17.15	13.75–19.50	18.94	12.00–21.50
Rocky Mountain:[2]								
Interstate	13.21	8.93–16.00	14.45	8.93–16.00	14.03	8.93–15.00	14.48	8.93–17.55
Intrastate	5.09	11.51–16.90	----------	----------	17.29	17.00–17.50	11.57	9.75–12.00
Permian Basin:[2]								
Interstate	16.41	12.50–16.66	16.92	14.50–17.50	16.30	14.50–17.50	16.73	14.50–18.00
Intrastate	16.97	3.65–19.25	16.28	15.24–22.00	17.11	13.00–18.00	18.33	12.00–20.25

[1] The term weighted average is defined as the sum of the annual volume of each contract multiplied by the applicable rate of each contract divided by the total annual volume of all contracts dated in the respective year.

[2] Prices are initial contract rates except for South Louisiana, which includes tax reimbursement. Prices were reported at, or converted to, pressure of 14.65 lb./in.²a except for South Louisiana, which is based on pressure of 15.025 lb/in²a

Sources: Interstate: Foster Associates, Inc., from data supplied to Federal Power Commission. Intrastate: Federal Power Commission, Docket No. R–389A, "Initial Rates for Future Sales of Natural Gas for All Areas," Sept. 9, 1970.

Dr. Ture. This result is sharply at odds with those which would have occurred if producers had operated noncompetitively in the intrastate market. On the other hand, they are precisely the results one would expect if the gas production industry is highly and effectively competitive.

The findings for this period are so urgently persuasive that the gas producing industry was highly and effectively competitive in the unregulated intrastate markets that any assertion that it no longer is should require the most rigorous proofs. At the very least, it would be necessary to explain why the industry had changed in so short a period of time from a highly, effectively competitive one to a highly noncompetitive one.

The second test is a comparison of the spread among gas prices in the intrastate market with the spread among costs of production of the gas. If the industry is highly and effectively competitive, the dispersion in prices in any region in the intrastate market should be substantially less than the dispersion in costs. If the industry were significantly noncompetitive, on the other hand, there should be much less of a difference between the respective dispersions.

A comparison of the range of prices of intrastate sales of gas contracted for in 1969 with the corresponding range of partial costs of producers selling gas in the intrastate and interstate markets is shown in table 4. Clearly, the range in intrastate sales prices—cents per million cubic feet—in the southern Louisiana, Rocky Mountain, and Persian Basin regions is far less than the range in the costs shown for that gas.

[Table 4 follows:]

TABLE 4.—DISPERSION OF PARTIAL GAS COSTS[1] AND PRICES—SELECTED REGIONS, 1969

[In cents per thousand cubic feet]

Region	Range of elements of gas production costs	Range of intrastate sales prices
Southern Louisiana	1.36–93.73	19.50–23.68
Rocky Mountain	1.64–14.45	9.75–12.00
Permian Basin	1.67–518.82	12.00–20.25

[1] Costs used in the arrays consist of direct lease operating expenses and depreciation, depletion, and amortization reported on the 3 gas well gas lease classifications of gas only, gas condensate with lease separation, and gas condensate with no lease separation. While the items of costs used do not represent all cost data reported in the cost questionnaires, they do represent the major operating costs which can be identified with gas well production without allocation.

Other major items of costs reported in the cost questionnaires such as exploration and development costs, investment in leases and equipment, and royalties generally require allocation to gas well gas in order to derive total costs. These costs, therefore, are not included here. Such allocations and derivations are subject to difference of opinion on methods to be employed. Consequently, any array of individual company costs would be subject to question on allocation bases. To avoid that question only the selected costs identifiable directly with gas well gas production reported here have been used.

While these arrays do not represent total company gas well gas costs or a proxy, they nevertheless do indicate the range of costs experienced by individual companies in the industry.

Source: Cost questionnaires filed by producers with, and available at, the Federal Power Commission.

Dr. TURE. These test results strongly support the conclusion to be drawn from the first test, pertaining to the similarity of gas prices in both regulated and unregulated markets: The natural gas producing industry is highly and effectively competitive. Taken together, these test results, along with the data and analysis pertaining to the structure of the industry presented above, impose, in my judgment, an enormous burden of proof, both analytical and factual, on those who assert that the industry is significantly noncompetitive.

The argument that links the degree of competitiveness of the natural gas industry to the need for regulating the price of gas seems to be that the shortage of gas results from the alleged fact that gas producers are noncompetitive, that the prices they would set if unregulated would be based on contrived shortages, and that if gas prices were established by the FPC at the level of gas costs, regulation should not be blamed for the shortage. It is further argued that, given these facts, deregulation of interstate gas prices would result in prices in excess of a just and reasonable price, affording windfall profits to producers and impairing the interests of consumers.

This argument raises serious issues of both fact and analysis. The assertion that the gas producing industry is noncompetitive is not justified by analysis of the characteristics and market results of the industry. On the contrary, the industry is highly and effectively competitive. But quite apart from those findings, the basic premises upon which the arguments for regulation are based are subject to serious challenge. These premises are: One, prices set by the FPC equal to estimated costs of production are the same as the market prices which would prevail in competitive markets; two, cost-based regulated prices are in no way responsible for the existing and prospective gas shortages; and three, the price increases which would result if interstate gas were deregulated would be excessive, would provide windfall profits for producers, would injure consumers, and would not be necessary to deal with the gas shortage.

It is widely believed that regulation by a public authority of the price of a commodity or service aims at achieving the results which would prevail if the commodity or service were sold in a perfectly competitive market. Moreover, the competitive market price which regulation ostensibly aims at reproducing is asserted to be equal to the cost of producing the commodity or service.

Basic economic analysis demonstrates that any company, if it maximizes its profits, produces that quantity of its output the marginal cost of which is equal to the marginal revenue. Under conditions of perfect competition, marginal revenue for the company is equal to the prevailing market price.

In regulatory practice, however, it is not the marginal but the average cost to which the regulated price is equated. The average cost of that best, profit-maximizing quantity for the company to produce and sell, however, will coincide with its marginal cost only if the market is in longrun equilibrium.

Longrun equilibrium, however, is hardly a normal or usual state of affairs in the dynamic real world. The mere fact of an observed increasing market demand for a product or service is sufficient to establish that market conditions are other than longrun equilibrium.

Any assertion that the average cost of gas is the competitive market price is simply, unmistakably wrong. It is wrong in the context of the rudimentary theory of competitive price. It is wrong as a characterization of the real world state of affairs. And it is wrong irrespective of one's belief as to the competitiveness of the gas producing industry.

The problem with cost-based price regulation is not merely its conceptual frailty, but also that it prevents the market from performing its essential functions efficiently. Such price regulation precludes market clearing, resulting either in surpluses or in shortages of gas.

If FPC regulates the price of gas, the market will clear only if the regulated price is exactly that at which the quantity of gas demanded is precisely equal to the quantity that will be supplied. At any other price, either a shortage or surplus will exist, irrespective of whether the gas producing industry is highly monopolistic or effectively competitive. But since the price fixed by FPC ostensibly is equal to the average cost of gas, price regulation will clear the market only if what is deemed by the FPC to be the average cost by purest chance coincides with the actual market-clearing price.

Even if by pure chance the price fixed by the FPC today clears today's market, changes in demand and in costs will make that price invalid as those changes occur. Effective—that is, market-clearing—price regulation, therefore, requires perfect forecasts by FPC of changing cost and demand conditions.

It must surely be evident that FPC has seriously underestimated both the increase in demand and the increase in the costs of gas production. The industry is appropriately characterized as one of increasing costs. Efforts to increase gas supply by the addition of reserves result in sharply rising costs. Taken together with the rapidly accelerating increases in the demand for gas, these factors have called for substantial increases in gas prices if shortages were to be averted. FPC ceiling prices, no matter how determined, have fallen far short of those required to clear the market. Since FPC has set ceiling prices equal to its estimates of the average cost of gas, regulation must be blamed for the gas shortage that has developed. Moreover, regulation per se is responsible for its shortage, entirely irrespective of the degree of competitiveness of the regulated industry.

One of the principal objections voiced against deregulating the price of natural gas in order to deal with the gas shortage is that since the industry is monopolistic, the price increase resulting from deregulation would provide windfall profits to producers. The implication in this objection is that price increases will result from deregulation only because the industry is allegedly monopolistic. Since the industry is monopolistic, so the argument goes, the price increases will afford windfall profits to the producers; these windfalls, presumably, would not be realized if the industry were competitive. There is, moreover, a further implication that windfalls are intrinsically objectionable.

It is evident that at the existing FPC ceiling prices the quantity of gas supplied is less than that demanded. Deregulation will result in an increase in gas prices, irrespective of the competitiveness of the gas producing industry. The extent of the price increase will depend primarily on the elasticity of the market demand for gas, on how large that demand is, on the marginal costs of gas production in the short run, and on the increase in costs for additional reserves over the longer run.

The objection to windfall profits seems to be based on the idea that such profits are not earned, that they are realized because of events over which those receiving them exercised no control. It is, of course, the very nature of windfalls—whether profits or losses—that they are unanticipated, since if they had been correctly forecast, the adjustments made by the market participants would have precluded their materializing.

Windfall gains and losses occur because information is not complete or fully accurate. But information is not costless, and the more nearly complete the information desired, the greater will be the cost of its acquisition. Moreover, the more dynamic the economic environment, the more difficult it will be to obtain information. Clearly, then, information in any industry or market is likely to be far less than complete, particularly in a highly dynamic economy. Windfalls, therefore, are likely to be frequent and widespread. To impute something undesirable to windfalls, whether gains or losses, is to wish for costless, perfect information as a universal state of affairs.

To imply that windfall profits are realized only by monopolists suggests that only monopolists have imperfect foresight about cost and demand conditions or are consistently, even though unpredictably, lucky. Indeed, if the market power-administered price view were correct, monopolists presumably would have superior foresight and would realize windfall gains or losses far less frequently than others.

Windfalls must be clearly distinguished from anticipated variations in the outcomes of business ventures. Virtually all investment decisions involve, either explicitly or implicity, an estimate with varying weights of a range of possible outcomes, from losses (failure to recoup the investment) to bonanzas (profits very substantially above those realized on the average). This variation in possible outcomes is the principal measure of the risk of a venture. The fact that perhaps 1 out of 10 ventures by a company results in extraordinary profits does not mean that the company has realized a windfall. On the contrary, if such extraordinary profits were not occasionally realized, then the average outcome of some large number of investments over time, by the same token, would also be lower.

Such variation in results occurs in every industry, and regulated industries are no exception. Since producers occasionally realize very high returns on gas sold subject to FPC regulation, regarding those high return as windfalls would be to assert that regulation can no more than the unregulated market prevent the realization of windfalls. The argument that regulation must be continued in order to prevent windfalls, if they were defined as the extraordinarily high returns within the probability distribution of outcomes, then would be demonstrably wrong. And regulatory action cannot nor should it seek to prevent windfalls, correctly defined, in the dynamic real world.

In the case of a product or service the price of which is set by public regulation rather than the market, the potential for windfall profits in the event of deregulation is always present, irrespective of the competitiveness of the regulated industry.

One of the arguments for continued regulation of the price of gas is that deregulation would result in a price that exceeds the just and reasonable price for gas. Setting just and reasonable prices is one of the hallmarks of public utility regulation in the United States, despite the fact that "just and reasonable" is a term that defies precise economic meaning. Over the years, however, the terms has, apparently, come to mean a price at which the regulated company or industry will earn a normal rate of return on its capital.

The normal rate of return on investment is associated with market conditions of longrun equilibrium. Given the present and prospective shortages, the industry clearly is not in longrun equilibrium. Deregulation would surely result in an increase in the price of gas, irrespective of the competiveness of the industry. If FPC deems the present ceiling price to be just and reasonable—despite the fact that it has generated a severe shortage and continues to do so—then any market-clearing price will exceed the just and reasonable price, however competitive the industry.

Continued insistence on a regulated price for gas equal to the just and reasonable price based on, at best, grossly imprecise cost data, therefore, is the same as continued insistence on market disequilibrium.

Finally, the argument that continued regulation of the price of gas is necessary to protect the interests of consumers is equivalent to asserting that consumers are better served by artificially depressed prices and the resulting shortages than they would be by higher, market-clearing prices. Artificially low prices and attendant shortages necessarily mean that consumers who do get gas pay less for it than it is worth to some nonconsumers who, because of regulation, are precluded from bidding it away. The well-being of consumers taken altogether clearly will be greater if the supply of gas is allocated to those who value it most.

Examination of the characteristics of the natural gas producing industry and the data pertaining to its operations reveals that in every significant respect the industry is highly and effectively competitive. To argue that the industry is monopolistic and for that reason must continue to be regulated in its interstate operations in order to protect the interests of consumers is to urge the indefinite perpetuation of gas shortages. As shown, regulated prices based on arbitrary and imprecise computations of average production costs are not the prices which would prevail in an unregulated competitive market. Regulated prices do not serve the interests of consumers; rather, under present and foreseeable circumstances, they generate shortages which impair consumer well-being.

Senator HART. Thank you very much, Dr. Ture.

At 12:30, under an earlier order, the Senate will have a rollcall vote on nominations for the FBI Director. Given the fact that it is now 12:27, I suggest that after one question we recess and resume at 2 o'clock. Will you be able to do that?

Dr. TURE. Yes.

Senator HART. For the record, would you state in summary your professional qualifications?

Dr. TURE. Yes, sir. I am a Ph. D. and M.A. in economics, granted by the University of Chicago. My present position is president of Norman B. Ture, Inc., an economic consulting firm in the District of Columbia. My company provides research and consultant services to businesses, trade associations, and Government with respect to a wide area of problems, particularly those concerning public policy in the general field of economics. I held academic positions with Illinois College, the University of Pennsylvania, and George Washington University. Before establishing my firm I served as an economist with the Planning Research Corp. That is a private, for-profit contract research company. Prior to joining PRC I was director of tax studies at the National Bureau of Economic Research, Inc., from 1961 to 1968. It is a very prestigious, highly estimable, nonprofit research institution. Earlier I served as a member of the staff of the Joint Economic Committee from 1955 to 1961, and before that on the analysis staff, tax division, in the U.S. Treasury.

I served on President-elect Kennedy's task force in 1960. I was chairman of President-elect Nixon's task force on taxation in 1968 and I served as a member of the President's business tax task force in 1969–70.

Senator HART. Thank you. I know that was in your prepared and full statement, but I thought we should have it for the record.

We recess to resume at 2 o'clock.

[Whereupon, at 12:30 p.m., the subcommittee recessed, to reconvene at 2 p.m. this same day.]

AFTERNOON SESSION

STATEMENT OF DR. NORMAN B. TURE, ON BEHALF OF THE GAS SUPPLY COMMITTEE—Resumed

Mr. BANGERT. Mr. Ture, in your statement you gave a brief explanation of the Gas Supply Committee and I wonder if you could develop that a little more fully in terms of what affiliations they may have.

Were they part of the American Petroleum Institute, the American Gas Association or are they independent of these groups?

Mr. TURE. Mr. Bangert, I don't have that information for you. My relationship with the Gas Supply Committee is that of a consultant—a client relationship—and I am certain that information is available from the Gas Supply Committee.

Mr. BANGERT. They employed you as a consultant for this particular hearing; is that correct?

Mr. TURE. Yes.

Mr. BANGERT. Have you testified on their behalf before?

Mr. TURE. No; I have not.

Mr. BANGERT. Have you testified with respect to natural gas in the past?

Mr. TURE. Not before a congressional committee, but I have prepared and submitted testimony to the Federal Power Commission in recent years with respect to the supply of natural gas.

Mr. BANGERT. In what connection did you testify before the Federal Power Commission?

Mr. TURE. I beg your pardon?

Mr. BANGERT. In connection with what did you testify before the Federal Power Commission?

Mr. TURE. The question was raised the other day as to an econometric staff study for the supply of natural gas that was prepared for the staff by Dr. Kazoom of the Massachusetts Institute of Technology. I was retained along with several of my colleagues to evaluate Dr. Kazoom's study.

Mr. BANGERT. Is this the Planning Research Corp?

Mr. TURE. Yes.

Mr. BANGERT. Other than your experience in connection with this testimony, have you written generally on natural gas or natural gas reserves?

Mr. TURE. I have not.

Mr. BANGERT. On page 11 of your statement, at the end of the first paragraph, you indicate:

> Indeed it has been shown that given the existence of other conditions of perfect competition, the perfectly competitive market solution may be reached when there are only two companies.

Mr. TURE. Right.

Mr. BANGERT. And you cite Fama and Laffer's American Economic Review article?

Mr. TURE. That's right.

Mr. BANGERT. And as I read what they say, under certain conditions of general equilibrium, with two or more noncolluding firms, it is perfectly competitive.

Mr. TURE. That's right.

Mr. BANGERT. So would you agree with that caveat in their statement?

Mr. TURE. There are a number of caveats in their statement, explicit and implicit, and they are all very important caveats, indeed. One of them, which you have not alluded to, clearly is no barrier to entry.

Mr. BANGERT. Well, is this then what you meant when you say "given the existence of the other conditions to perfect competition"?

Mr. TURE. That's right; if there is no barrier to entry, the opportunity and likelihood of any collusive arrangement being of any duration at all is extraordinarily remote.

Mr. BANGERT. Are barrier to entry and possible collusiveness the two conditions?

Mr. TURE. Let me qualify it again. I have ticked off, both in my prepared statement and oral summary, the standard criteria for a competitive industry. Now, those conditions must be met and they are alluded to either implicitly or explicitly in this article which I cited by Fama and Laffer.

Indeed, those two conditions must be met. To repeat, there are no barrier's to entry. Too, the principal condition that is required or the single most important condition that is required is that no one of those firms has exclusive proprietary interest in one or more of the production inputs or processes required for the production of the services.

But, you see the point of this article was to address itself to the question of how many firms you have to have in order to be comfortable that you have a substantially competitive market solution.

Quite interestingly, the analytical conclusion is that two will do. It is not, incidentally, a perfectly novel idea. George Stigler of the University of Chicago has offered the observation on a number of occasions that there is simply no way to determine what is the minimum number of firms that are required.

In fact, he cites among other conditions that will act exactly the same as a substantial number of good substitutes or a few numbers of very good substitutes.

Mr. BANGERT. Would you agree competition can range all the way from duopolistic to monopolistic to be perfectly competitive?

Mr. TURE. In the abstract, yes.

Mr. BANGERT. What do you mean by that?

Mr. TURE. One would have to specify the conditions under which that operates. Is there an area in the economy that supports that monoply duopoly and maintains it over an extended period of time? It is difficult to find any answers to that.

Does that monopoly or duopoly depend upon some institutional arrangement, fortified by legal sanctions, which afford the exclusive control or ownership of production inputs or processes that are absolutely essential for that production process to produce that product or service? Again, you will find very few instances. I don't think I could cite you one in the U.S. economy in which that is true. This is not to preclude the possibility.

Mr. BANGERT. Do you have any idea how likely perfectly competitive requirements are met in a duopolistic situation?

Mr. TURE. Could you cite for me, sir, a duopolistic situation? Offhand, I can't think of one.

Mr. BANGERT. Dr. Meadsday says we can't, but you raised the possibility, so we thought you might know.

Mr. TURE. No, I raise it as a theoretical possibility.

Mr. BANGERT. Does that have no application to the testimony on natural gas today?

Mr. TURE. No, indeed, sir. The line of analysis with respect to the competitive status of the natural gas industry that I have presented to you is to say what the conditions are that are set classically for perfect competition.

I tried to describe that for you in the prepared statement. Then, I proceeded to examine the natural gas producing industry against those critera. I am perfectly satisfied that any fair appraisal of these facts would suggest that it comes very, very close indeed to meeting those criteria.

Mr. BANGERT. On the concentration of production sales that you mention on page 21, I am wondering if the structural characteristics of the natural gas industry make sales a good or poor measure of industry concentration?

Mr. TURE. Well, in the context of my observations about concentration ratios or any measure of concentration conventionally employed as an indication of competitiveness or lack of competitiveness, in the context of these remarks you are free to choose among any such indicator of size that you prefer and they will be equally unimpressive and unrevealing.

Concentration ratios *per se* are not informative.

Mr. BANGERT. Well, I think Dr. Wilson who will follow you this afternoon probably agrees with you on that to a certain degree.

Mr. TURE. Sure. I have observed in my prepared statement that, indeed, since a lot of work has gone into the development of concentration ratios by one or another members of my profession, one is disinclined to simply throw it all out. So there is an inclination to try to find some way in which concentration ratios could help.

The suggestion has been made by others as well as by myself, that in fact, if you can find other objective indications of lack of competition, noncompetitive industry structure, noncompetitive market situations, then conceivably, given that other evidence, you might look to concentration ratios as being supportive of those observations—but not the other way around.

Mr. BANGERT. Well, insofar as concentration ratios are a reliable indication of anything at all, in the natural gas industry, would concentration ratios of uncommitted reserves by a particular area be of any more assistance in determining competitiveness than production sales ratios?

Mr. TURE. No. As you phrased the question, the answer is categorically "No." You began the question by inquiring as to whether or not insofar as concentration ratios are any use at all. Let me explain the way those concentration ratios are useful.

They are simply measures of differences in size of the companies. Differences in size of companies per se have no necessary bearing on the degree of competitiveness or noncompetitiveness in the industry. With that qualification in mind, let me elaborate.

If you have a sufficient longtime series of data, then you might just as well use sales or an output measure, any number of similar measures, to describe differences in size among companies and changes in the size distribution of companies in an industry over time.

If you wish to add data pertaining to certain elements of the capital owned by those companies, in the case of a natural gas producer's reserves at his disposal, you may do so. Again, you will simply be getting another piece of information about the size distribution of the companies and the industry and the way it changes in time if you have an adequate time series constructed on a statistically consistent basis.

Mr. BANGERT. Well, could you theoretically then have an industry with high concentration ratios that nevertheless would be very competitive?

Mr. TURE. Yes, surely.

Mr. BANGERT. Therefore, concentration ratios, in your estimation, may or may not be a key to anything.

Mr. TURE. I can think of a number of analytical problems for which it might be useful to find out the size distribution of the entities comprising an industry or sector of the economy and how they have changed through time in response to various other developments in the economy.

Indeed, it would be useful to have these measures of the distribution by size of the companies in that industry or sector.

Mr. BANGERT. On page 48 of your statement, in the first full paragraph, you talk about marginal and average costs. You indicate in the regulatory practice, however, it is not the marginal but the average cost to which the regulated price is equated. The average cost of that best quantity for the company to produce and sell, however, will coincide with marginal costs only under two limiting circumstances.

I guess where I am confused is that I don't understand the costing methodology that the Federal Power Commission has used. Is there a different methodology for flowing gas as opposed to new gas?

Mr. TURE. Methodology for what purpose, sir?

Mr. BANGERT. For costing.

Mr. TURE. For measuring average cost?

Mr. BANGERT. Right.

Mr. TURE. I don't think I can give you a firm answer to that question. In other words, does the Federal Power Commission indeed routinely attempt to measure the average cost of flowing gas?

Mr. BANGERT. Well, that is what I am trying to find out from you.

Mr. TURE. I would suspect that the answer would be better obtained from them, sir. I can't answer that.

Mr. BANGERT. Well, do you know what the latest national cost is as per the *Belco* case? What is the average cost, the high and the low?

Mr. TURE. No; I don't. This is one of the problems that I am sure you are familiar with. There are substantial elements of joint and overhead costs in the industry and there are enormous difficulties, conceptual and practical, in allocating those costs as between gas and other petroleum products.

So far as the joint product case is concerned, to the best of my knowledge, there is not to be found anywhere in the economic literature a definitive solution as to how that allocation is to be made. So any costing of gas or any other jointly produced product entails a high degree of difficulty.

I have briefly scanned, and I confess that it has escaped my memory because it made no sense to me, a cost index that was used and it struck me as so arbitrary and ill-founded with respect to the basic determinants of costs of any operation as to not really be worthwhile.

Mr. BANGERT. On page 15 of your full statement you indicate that joint operating agreements, where they are made, often are required as conservation measures and for efficient production. I am wondering, even given the fact that they may be made for conservation measures whether or not you really don't have a blunting of competition, since the producers in the joint operating agreement marketed all in one package stream?

Mr. TURE. There are standard provisions, as I understand it, for allocations to the participants in such a joint arrangement of their respective market shares.

Mr. BANGERT. But in the *Permian Basin* case and the *Southern Louisiana* case, wasn't that what the court and the Commission found that caused the imperfect market structure in those instances?

Mr. TURE. I am not familiar with those decisions so I cannot reply to the question, but I should be astonished if that were the case. Let me point out that joint arrangements of the sort that have been very widely described here and elsewhere in the natural gas producing industry are used elsewhere in the U.S. economy. Even in the field of business in which I operate, arrangements of this sort are quite frequent, and I would say in no way at all has my participation with other firms in any way, shape, or form ever blunted my competitive edge.

Mr. BANGERT. Do you consider yourself to be an expert in the natural gas industry?

Mr. TURE. With respect to the question as to whether or not the industry is competitive, it seems to me what is required is good, sound, fundamental analytics applied to the structure of the industry and I think I am competent to do that and I have done so.

Mr. BANGERT. But you haven't done any particular work in the natural gas industry?

Mr. TURE. I never have been directly or indirectly employed by a gas producer or by a regulatory agency.

Mr. BANGERT. Have you done any economic studies in this area?

Mr. TURE. No; aside from those that I have already put into the record for you.

Mr. BANGERT. I have no further questions, Mr. Chairman.

Senator HART. Mr. Chumbris.

Mr. CHUMBRIS. I have no question, Mr. Chairman, thank you.

Mr. TURE. I should say that I do not ordinarily appear before a congressional committee with dark classes, but in the interest of being able to follow my testimony and being able to read it, I found it was necessary.

Senator HART. I am glad it is not a permanent condition.

Mr. TURE. Thank you.

[The following documents were received for the record. Testimony resumes on p. 419.]

MATERIAL RELATING TO THE TESTIMONY OF DR. TURE

Exhibit 1.—Study by Dr. Norman B. Ture Entitled "Competition in Natural Gas Production"

COMPETITION IN NATURAL GAS PRODUCTION

I. THE ISSUES

The increasing shortage[1] of petroleum products emerging over the recent past and in prospect raises serious questions about the effectiveness of the FPC's regulation of natural gas wellhead prices. The central issue is whether FPC regulation of the wellhead price of natural gas in interstate markets permits (1) the efficient distribution of existing supplies of natural gas among producers, and (2) meeting longer-term demands for natural gas. Regrettably, the issue has been obfuscated by the allegation that the natural gas production industry is "monopolized" and that therefore permitting the price of natural gas to be determined by market conditions would not "protect the interests of consumers." Collaterally it is asserted that since the producers of natural gas allegedly are not perfectly competitive, deregulation of the wellhead price of natural gas would not result in a "just and reasonable" price but would afford "windfall" profits for producers.[2]

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[1] The meaning of the term "shortage" is highly varied. In the field of public policy, it generally means that some policy maker feels that the quantity of something or other is less than it "should be". As an economic phenomenon, it means that the quantity of something or other that people want to buy at a prevailing price is greater than the amount that will be supplied at that price.

In an unregulated market for any product or service, the price of the product or service serves three principal and related functions: (1) it provides information to buyers about the value of the product or service relative to that of others and, accordingly, acts as a guide to purchasing decisions, (2) it acts to ration the existing supply of the product or service among buyers on the basis of the value buyers place on it relative to alternatives, and (3) it provides the information required by producers of the product for decisions about how much of the product or service to produce and to offer for sale. Where there is a substantially continuous flow of production, the price arrived at in the unregulated market equalizes the quantity which buyers want to purchase with that which producers want to sell, thereby clearing the market. This is true whether the market is highly competitive or noncompetitive.

The fundamental issue is whether FPC regulation of the price of natural gas, irrespective of the basis upon which FPC sets the price, results in a price which adequately performs these functions. It is evident that at the FPC-set prices of gas prevailing to date, no matter how those prices may have been justified by FPC, the market is not cleared. Rather, increasingly serious "shortages" have developed and appear likely to become more severe.[3] Moreover, FPC-regulated prices obviously have been too low to induce producers to invest sufficiently in finding new reserves to meet the current demand for gas in the interstate market at prevailing prices.[4] And at the prevailing FPC ceilings on gas prices, current and future investment by producers in developing additional reserves will not be adequate to meet the prospective demand for gas at the existing price to consumers.[5] If the price of gas is not increased to the level that will clear the market, it will be necessary to find some means other than the price for determining which gas users will get how much gas.

The central policy issue is whether (a) FPC regulation of the price of gas can be relied upon to clear the market and to call forth sufficient additions to reserves to meet prospective demands, or (b) deregulation of the wellhead price is necessary to achieve these results. The chief argument against deregulation rests on the assertion that the industry is noncompetitive; if deregulated, it is asserted, the price of gas would be higher than that which would prevail in a perfectly competitive market and would exceed a price that is "just and reasonable," producers would receive "windfall profits", and hence the "interests of consumers" would not be protected.[6] Some of these arguments are substantively empty, some are based on misapprehension of the facts, and some are based on faulty analysis. For example, in what sense are the interests of consumers protected by fixing the price of gas at an artifically low level so that the consumers cannot obtain the amount of gas they want at that price? It is difficult to believe that the consumer will feel "protected" by the assurance that even though he can't get the gas he wants, if he could get it, he'd pay a relatively low price for it. How "just or "reasonable" is a price set by regulatory authority which requires an arbitrary determination of which consumers may have how much gas? What information would one have to have to know by how much the price of gas would rise if it were unregulated and whether that price would be greater if the industry were less or more competitive? And if producers are to be prevented from realizing greater profits in developing reserves, what means are there for increasing the future supplies of gas at a lower rather than greater real cost for the economy as a whole?

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[2] The use of quotation marks is to make it clear that these phrases are evocative or symbolic, in the context in which they are used, rather than having rigorous and unambiguous meaning necessary for analysis or policy purposes.

[3] Contrary to a widespread allegation, the shortage is not attributable to a reduction in output or sales by natural gas producers. Marketed gas production in 1972 was 26.0 percent greater than in 1967: production had increased at an average annual rate of 4.7 percent from 1967 through 1972. Cf. American Gas Association, *Gas Facts,* p. 29, and U.S. Bureau of Mines.

[4] Cf. National Petroleum Council, *U.S. Energy Outlook, A Summary Report,* December 1972, p. 13. "Despit the superior characteristics of natural gas, domestic prices of this fuel are held by the FPC to a fraction of the price of substitute fuels. . . . At the same time that the Government engages in this supply-limiting action, serious consideration is given by Government and industry to the importation of natural gas at substantially higher prices. . . . As a result of these artificially low prices, reserve additions (excluding North Slope) in the last 3 years have averaged about 9.5 TCF/year while consumption has age. Cf. their "The Natural Gas Shortage and the Regulation of Natural Gas Producers."

[5] *Ibid.,* p. 7. ". . . to support assumed ranges of activity levels . . . real energy "prices" of domestic fuels at the wellhead or mine must rise significantly by 1985." For gas at the wellhead, the estimated required increased is 80 percent to 250 percent. A recent article by Professors Stephen Breyer and Paul W. MacAvoy provides an excellent theoretical and empirical analysis of the contribution of FPC gas price regulation to the present gas shortage. Cf. their "The Natural Gas Shortage and the Regulation of Natural Gas Producers." *Harvard Law Review,* April 1973, pp. 941–987.

[6] Cf., for example, Testimony of Dr. John W. Wilson, Chief, Division of Economic Studies, Office of Economics, Federal Power Commission, and Staff Reply Brief, both before the Federal Power Commission in Belco Petroleum Corporation, *et al.,* Docket No. C173–293, *et al.*

II. MARKET STRUCTURE OF THE NATURAL GAS PRODUCING INDUSTRY

To repeat, the central policy question is whether any price for gas other than the unregulated market price will effectively deal with the mounting shortages of gas. But if that issue is to be clearly perceived and effectively dealt with, the questions concerning the degree of competitiveness of natural gas producers and the implications of alternate assessments of their competitiveness for pricing policies and price levels in the absence of regulation must first be resolved. The following discussion examines analytically and factually the salient features which are pertinent to determination of the competitiveness of the natural gas producing industry. In section III, the discussion turns to the questions whether, irrespective of the findings of this section, (1) prices set by regulatory agencies equal to estimated costs of production[7] are the same as the market prices which would prevail in competitive markets, (2) cost based regulated prices can effectively deal with existing and prospective gas shortages, and (3) deregulation would afford windfall profits and impair the interests of consumers.

A. *Distinctions Between Competitive and Noncompetitive Industry Structures*

There is a prevalent misconception that companies in noncompetitive markets exert their "market power" to "administer" the prices of the products or services they produce and sell. The terms convey the idea of a company's somehow controlling a market and accordingly being able to set or "fix" prices. But unless buyers of the product or services are willing to buy the same quantity of its irrespective of the price charged by the seller, and there is no known case where this is so, a producer-seller cannot control the market. In setting his price, the seller must be mindful of the quantity of his product which will be purchased at that price.

Because in the real world no company can control all aspects of a market nor, if the company wishes to maximize its profits, arbitrarily set a price for its products or services without regard for market conditions, many economists reject the notions of "market power" and "administered prices" as being useless either for describing reality or for rigorous economic analysis. For these economists, the distinction between perfectly and imperfectly competitive markets, awkwardly sought by phrases such as "market power" and "administered prices", is better and more precisely expressed by the terms "price taker" and "price searcher".

A "price taker" is a company operating in a market . . ." in which each seller . . . provides so insignificant a part of the total market supply that he could not depress the price by offering to sell more. . . ." (or raise the price by offering to sell less). At the prevailing market price, he can sell as much as he has available. This kind of a market is called a price-takers market.[8] A "price searcher", on the other hand, cannot assume that the quantity of the product or service he offers for sale will have no influence on the market price. He must, instead, search for the price at which he does best, i.e., maximizes his profits. He does indeed set—or "administer"—his price, *but not in flagrant disregard of the market conditions which, irrespective of his preferences, dictate to him how much of his product or service he can sell at each price.*

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[7] By its own admission, FPC gas cost estimates are much less meaningful or accurate than suggested by the mathematical precision with which they are presented. These estimates require highly arbitrary allocations of overhead items and joint costs. "The cost computations used in this and other area rate proceedings seem to be mathematically precise. They are not. Allocations of costs are by nature matters requiring a substantial amount of judgment . . . Commissioner Carver . . . pointed out the imprecision of cost calculations . . . Commissioner O'Connor . . . pointed out in detail the unavoidable inaccuracy of the statistics and allocations upon which cost computations were based . . ." (F.P.C. Opinion 595 in the Texas Gulf Coast area rate decision, Docket Nos. AR64-2, et al., pp. 10–11).

[8] Armen A. Alchian and William R. Allen, *University Economies*, Wadsworth Publishing Company (Belmont, California, 1967), pp. 104–106.

The distinction between "price taker" and "price searcher" is merely a matter of degree. Each "sets" his price, hopefully, at the level that will maximize his profits. "It's just easier to find that price in some price taker's markets." The price searcher, on the other hand,' . . . has to resort to trial and error, never being sure it has found it" (i.e., the profit-maximizing price).[9]

What are the differences in degree between price takers' and price searchers' markets? The standard response to the question is to delineate markets in terms of the degree of their competitiveness. At the one extreme, the necessary conditions for the perfectly competitive market are usually listed as:

(1) So large a number of buyers and sellers that no one of them can affect the market price by changing the amount he offers to buy or sell.

(2) Independence of action by each buyer and seller, i.e., since there are so many buyers and sellers, it impossible to organize effective combinations of either, and moreover, for the same reason, each buyer or seller recognizes that he need not be concerned about the actions of others.

(3) Complete knowledge by each buyer and seller of the offers to buy and sell by the participants in the market.[10]

(4) There is no significant barrier to the entry of new companies nor to the change in scale by existing companies in response to changes in market demand.

(5) As a corollary, the product or service being sold is substantially undifferentiated, i.e., there is a substantial number of reasonably close substitutes (or even a small number of very good substitutes) for the product or service sold by any one company.

Given these conditions for perfectly competitive markets, the demand curve facing any one seller is infinitely elastic, i.e., he can sell any quantity he has available at the existing price.[11]

At the other extreme, in the perfectly monopolized market there is only one seller. Given the conditions of demand for his product or service, i.e., how much of his product or service purchasers are willing to buy at any given price, variations in the quantity he offers for sale will affect the price at which each quantity can be sold. He can sell more of his product or service only by reducing the price; if he raises the price he will sell less. He is, in other words, a price searcher, recognizing that his actions will affect the market price and seeking that price at which he will do best.

The principal condition for the existence of the monopolized market is that the monopolist has exclusive control over one or more of the resources essential to the production or sale of the particular monopolized good or service. A further condition for the existence of a monopoly is that no other company produces and sells a close substitute product or service equally accessible to the buyers of the monopolist's product. The would-be monopolist, indeed, may invest in efforts to differentiate his product or service from that of other producer-sellers, i.e., to make his offerings more attractive and desired in some way or other than that of others. To the extent that he succeeds, the demand for his output is greater and/or less elastic than otherwise, but product differentiation does not result in the producer's being able to obtain any price he chooses for a given quantity of his output. And product differentiation is not costless. The price searcher seeking to differentiate his product, accordingly, will invest in differentiation up to that point at which the increase in his revenues from increasing the demand for his product and/or making that demand less elastic is just equal to the incremental cost of the product differentiation.

With the possible exception of the markets for some raw agricultural products, perfectly competitive markets do not exist in the real world. It is equally clear that no perfect monopoly exists in an economy such as that of the United States.

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[9] Ibid., pp. 308–309.

[10] Cf. George J. Stigler, *The Organization of Industry,* Richard D. Irwin (Homewood, Illinois, 1968), pp. 5–7.

[11] By the same token, the supply curve facing any one buyer is infinitely elastic, i.e., he can purchase any quantity he wishes to without affecting the market price. In short, all buyers and sellers in perfectly competitive markets are complete price takers.

For the vast majority of products and services, actual market condition lie between these extremes.[12]

B. Structural Characteristics of the Natural Gas Producing Industry

Viewed in the light of the basic conditions of perfect competition and monopoly, delineated earlier in this discussion, the natural gas production industry surely must be characterized as highly and effectively competitive.[13]

1. Number of gas producing companies

One of the principal conditions for perfect competition is that the industry in question consists of so large a number of companies that the actions of no one company has a significant influence on the price of the industry's product. Rigorous analysis affords no basis for determining the minimum number of companies required to satisfy this condition. Indeed, it has been shown that given the existence of the other conditions for perfect competition, the perfectly competitive market solution may be reached when there are only two companies.[14]

Data from various government sources show a very large number of natural gas producers. In 1968, for example, 3,218 Federal corporation income tax returns were filed by companies classified as producers of crude petroleum, natural gas, and natural gas liquids. This number does not include integrated producer-refiner companies which were classified under petroleum refining. For the same taxable year, there were 35,738 Federal individual income tax returns filed with business income schedules showing crude petroleum, natural gas, and natural gas liquids production and field services as the principal source of the business income. And for the same year, there were 10,795 partnership information returns showing this industry classification as the major source of the partnership's income.[15] Even if as many as half of the individual and partnership returns under the broad heading reported income primarily from companies engaged in providing field services, the producer population was very large indeed.

The Census of Mineral Industries data are based on a different definition of the producer population.[16] For 1967, the Census shows 5,482 operating companies in crude petroleum and natural gas, down from 10,594 in 1963. Of the Census measure of the operating company population in 1963, about 15.4 percent were classified in the natural gas subindustry.[17]

According to the Federal Power Commission, there were 3,745 jurisdictional natural gas producers in 1971. The producer population covered by the FPC includes only companies in the interstate market and omits an intermediate number of producers selling less than 10 million MCF of gas annually interstate.

Despite the differences among these data sources with respect to the criteria for including companies in the population, even the minimum estimate shows a substantial number of producers.

2. Independence of action by producers

As noted earlier, a second condition for perfect competition is that companies in the industry act independently. This follows from the first condition, i.e., since there are so many companies in the industry, it is impossible to organize effective combinations among them for purposes of controlling the volumes of output and of influencing price.[18]

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[12] "Perfect competition" and "monopoly" are abstract analytical concepts which are intended to facilitate analysis. These formal abstractions do not conform precisely with reality, nor do they need to in order to be useful analytical tools. Engineers often analyze physical objects as if they were in a vacuum or moving without friction even though, in fact, a perfect vacuum or perfectly frictionless motion has never been observed. The fact that, in reality, a particular industry does not exactly conform to perfect competition does not at all imply that it is therefore a monopoly.

[13] The technical definition of "effectively competitive" is provided below at pp. 36–37. In nontechnical terms, "effectively competitive" means that the market results, i.e., price and quantity, differ only modestly and insignificantly from those of a perfectly competitive market.

[14] Cf. Eugene F. Fama and Arthur B. Laffer, "The Number of Firms and Competition," *The American Economic Review*, Volume LXII, Number 4, September 1972, pp. 670–674.

[15] U.S. Treasury Department, Internal Revenue Service, *Statistics of Income-Business Income Tax Return, 1968*. Not all of these individual and partnership returns were the returns of operating companies, of course; many of them probably reported income from participation in mutual-type funding of exploration and drilling activity. Nevertheless, these returns suggest a very large population of unincorporated producer businesses.

[16] Cf. U.S. Department of Commerce, Bureau of the Census, *1967 Census of Mineral Industries, Crude Petroleum and Natural Gas*, p. 13A–1.

[17] Ibid., p. 13A–5.

[18] Or that the costs of organizing and policing such combinations would significantly exceed the gains to the participants.

The extremely large number of natural gas producers clearly precludes the possibility of effective combination among any significant number of them. In an unregulated market, the difficulties which would be met in efforts by any few gas producers to exert substantial control over any significant part of the total producer population boggles the mind.

Often cited as evidence to the contrary is the prevalance of so-called "interties" or "interlocks". The terms refer to a variety of arrangements among producers to act jointly with respect to one or more aspects of bidding for leases, exploration and development activity, production, etc. These arrangements are made among a great many producers—among major and among smaller, independent producers. They are entered into with respect to domestic and foreign ventures and onshore and offshore leases. The company composition varies from arrangement to arrangement, with respect to both the identity of the companies and their shares in each arrangement.

These various arrangements existing at various times have been described and diagrammed by the FPC staff, by natural gas producers' representatives, by the industry press, by private research groups, by university scholars, etc. There is nothing furtive about them, nor is there evidence of concern by the producers over widespread public knowledge of the arrangements. Joint bids in public sales of leases on Federal lands and offshore do not in any way conceal the identity of the companies comprising the arrangements, nor is the fact of any such arrangement deemed to be the basis for disqualification of the group.

In a word, these so-called "interties" or "interlocks" are the antithesis of the collusive combination which would characterize the industry as noncompetitive. The openness of the arrangements, the diversity of the arrangements in which any one company, small independent or major, is engaged at any one time, the frequency with which new groups, consisting of different companies, are formed are evidence not of cartellike restriction of competiiton but rather of the independent pursuit of its own profit-maximizing opportunities by every producer in the industry.

No evidence has been presented to show that the so-called "interties" have reduced effective competition. If these arrangements were anti-competitive in character, there should be some concrete manifestation to that effect. The evidence as to the results of these arrangements, however, suggests quite the contrary, i.e., that they contribute to vigorous competition among producers. Consider, for example, their impact on offshore lease sales. If these groups were collusive, anticompetitive combinations, they would presumably operate to hold down the prices paid for such leases. In fact, however, both the total amounts of high bids and per acre prices in recent sales have been extremely high.[19]

The "interties," moreover, have facilitated rather than impeded competitive participation by producers other than the largest companies. In the sale of offshore leases in 1970 and 1972, groups headed by smaller and newer producers were among the top successful bidders. For example, a group headed by TransOcean Oil, Inc., a 51 percent owned subsidiary of Swift and Co., entered the third largest bid which was accepted in the December 1970 sale and had the top accepted bid in the December 1972[20] sale. If joint bidding were prohibited, it is unlikely that the smaller companies' financial resources would permit their effective participation in lease sales.

The impetus for producers, large and small, to form groups for bidding, exploration, production, etc., stems from diverse sources. To a considerable extent, group bids permit producers to expand the number of blocks on which they can bid without incurring the extraordinary risks associated with putting all one's eggs in one basket. The same is true in the case of the exploratory arrangements into which producers enter. Joint operating agreements, where they are made, often are required as conservation measures and for efficient production. In fact, many of these joint exploration and production arrangements are encouraged and even required by State authorities under laws intended to assure maximum efficiency in the recovery of oil and gas. They expressly provide, moreover, for separate marketing of the production from joint ventures.[21]

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[19] Cf. *The Oil and Gas Journal* for December 21, 1970, pp. 13 ff., regarding the December 17, 1970 sale of leases in the Gulf of Mexico off Western Louisiana; *The Oil and Gas Journal* for September 18, 1972, pp. 38 ff., regarding the September 1972 sale; and *The Oil Daily* for December 21, 1972, pp. 1–2, for the December 1972 sale.

[20] TransOcean, originally incorporated in April 1968 as a wholly-owned subsidiary of J. Ray McDermott and Co., concentrates its operations in exploration and development. It has been an extremely vigorous and highly successful producer, despite its recent entry. Cf. 1972 Annual Report of Swift and Company: "In the December, 1972, federal sale of offshore Louisiana leases, a group headed by TransOcean was highest bidder on two blocks totalling 8,237 acres. A position was established in the North Sea, where TransOcean obtained interests, or agreements to obtain interest, in 426,000 acres in the United Kingdom sector . . ." pp. 14–15.

All such arrangements, rather than reducing competition, serve to strengthen it. To the extent that they reduce risk they also reduce the cost of capital committed to additions to the supply of gas, hence increase rather than restrict gas supply. Insofar as small independents are included, the arrangements have the effect of expanding and diversifying lease-acquisition, exploratory, and production opportunities and capacity with respect to their capital resources. In every significant respect, "interties" and "interlocks" promote rather than inhibit competition among producers.

The widespread allegation that "interties" are evidence of collusive, noncompetitive behavior among producers is without foundation.

3. Barriers to entry

Another condition for perfect competition, collateral with a sufficiently large number of companies such that no one company can influence price, is that there is no significant barrier to the entry of new firms.

Barriers to entry into an industry are generally thought to arise from one or more of a number of factors, e. g., exclusive control by existing companies of some essential production input or process, some minimum scale of plant required for at least marginally efficient operation, large capital requirements, some absolute cost advantages enjoyed by the existing companies, or highly effective product differentiation, whether of the physical characteristics of the product or merely subjective. None of these entry barriers is significant in natural gas production.

According to Professor Clark A. Hawkins: "There are no apparent economies of scale . . . in discovering and producing natural gas. However, from the risk standpoint, there may be economies if it is recognized that, although risk may not be an obstacle to entry, it may be inversely related to size. A large company can drill more wells than a small company without facing bankruptcy if the wells are unsuccessful. Thus, although there may be modest capital requirements to entry, risks may be greater for the small firms. New firms may also be at a disadvantage due to existing firms having many of the best deposits—best in the sense of being easiest and/or cheapest to find. Some good leases and luck may be important requirements for entry of a producer. As for product differentiation, a barrier to entry is practically nonexistent apart from quality differences that are largely nature induced. Except for possibly the risk-factor, the barriers to entry for natural gas production are substantially less than in most manufacturing. Even the risk case is not clear, since it may be an inducement to certain types of venture capital that would be in a high marginal tax bracket. The rise of mutual-type funds selling pieces in drilling ventures in recent years is some indication that the high risks themselves do not deter entry." [22]

Professor Hawkins' assessment of entry barriers, if anything, overstates their severity. The risk factor he cites as a possible barrier is in part vitiated by the mutual-fund approach to financing independent exploratory and drilling ventures; the funds at risk for any one investor are relatively small, and the deductibility for income tax purposes of drilling costs and dry holes further reduces the potential maximum loss to the fund participant.

While new firms conceivably might be at a disadvantage because established firms have already discovered many of the best, most easily found, deposits, there is little *a priori* or concrete evidence to support this supposition. For one thing, the significant entry barrier, if there were one, would be some advantage for the large established companies in developing new reserves. On *a priori* grounds, it is difficult to identify any such advantage. Hawkins cites the case of Clinton Oil Company, founded in 1963, as one of the largest and most successful independent oil and gas operators in the Mid-Continent and Gulf Coast area.[23] Another example is TransOcean Oil, Inc.[24] One of the most dramatic examples of new entry is provided by Louisiana Land and Exploration Co. Prior to 1971, it sold fewer than two million MCF of gas a year to interstate pipelines and was not included in the FPC's annual *Sales by Producers of Natural Gas to Interstate Pipeline Companies.* But in 1971 it sold 37.5 million MCF to interstate pipelines. In the 1972 lease sales, it bid actively, alone and in combination wth other companies. The fluctuations in the producer population demonstrate that Clinton Oil Company, TransOcean, and Louisiana Land and Exploration are not isolated instances, but illustrative of the fact that the holdings of existing companies set up no significant barrier to entry by new producers.

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[21] Participants in such ventures explicitly include these provisions, modeled after the Unit Agreement form issued by the American Petroleum Institute, in their contractual arrangements.

[22] Clark A. Hawkins, "Structure of the Natural Gas Producing Industry," in Keith C. Brown, ed., *Regulation of the Natural Gas Producing Industry*, Resources for the Future (Johns Hopkins University Press, 1972), p. 164.

[23] Ibid., p. 138.

[24] See footnote 2, page 15.

Moreover, growth in production and sales of the smaller producers is often spectacular. The performance record of the companies shown in Table 1 is merely illustrative of a commonplace phenomenon in the industry.

TABLE 1.—GROWTH OF SALES BY SMALL NATURAL GAS PRODUCERS TO INTERSTATE PIPELINE COMPANIES., 1961–71

	1971 sales (billion ft ^{3})	Increase since 1961 (percent)	Annual growth (percent)
An-Son Corp	9.5	[1] 239	[1] 27.7
Apache Corp	11.4	246	13.2
Isaac Arnold	34.5	1,465	31.7
Exchange Oil & Gas Corp	21.7	[2] 141	[2] 24.6
Imperial American Management	15.1	[3] 76	[3] 76.0
King Resources Co	17.4	[2] 545	[2] 59.4
MAPCO [4]	23.4	398	17.4
Midwest Oil Corp	11.6	300	14.9
Monsanto Co	42.3	386	17.1
Newmont Oil	10.4	316	15.3
ODECO [5]	38.9	925	26.2
Rodman Corp	32.6	[6] 782	[6] 98.5
Samadan Oil	12.6	425	18.0
Stephens Prod. Co	39.3	293	14.7
TransOcean Oil, Inc.[7]	19.9	295	14.7

[1] Since 1966.
[2] Since 1967.
[3] Since 1970.
[4] Changed name from Producing Properties in 1964.
[5] Ocean Drilling & Exploration Co.
[6] Since 1968.
[7] Formed from operations of J. Ray McDermott Co. in 1968.

Source: Federal Power Commission, "Sales by Producers of Natural Gas to Interstate Pipeline Cos.," (1961–71).

Few of the major natural gas producers can match the growth record of the companies shown in Table 1. And surely these data urge that neither the majors nor the industry structure in general posed any monopolistic impediment to the remarkable growth performance of these small companies.

There is virtually no opportunity for gas producers to invest profitably in product differentiation. In most industries, companies attempt to differentiate their output from that of other companies, by imbuing it with some unique physical attribute, by advertising, by providing special services to its buyers, by locational factors, etc. None of the product differentiation devices is a realistic option for any gas producer. Any quality differences are the result of natural phenomena. They are not subject to exclusive proprietary interest by any one or small group of companies.

The large number of gas producers furthermore provides evidence that there are no significant barriers to entry, either inherent in the market or enforced by collusive action by producers. From 1951 through 1963, the number of corporate returns filed by crude petroleum, natural gas, and natural gas liquid producers increased from 2,934 to 4,549. Thereafter, the number of returns declined to 3,218 for the taxable year 1968. Among proprietorships, the number of returns rose irregularly from 21,590 in 1957 to 35,738 in 1968. The number of partnership returns has fluctuated within a much narrower range, from a low of 8,449 in 1959 to a high of 12,467 in 1965.[25] These data strongly urge that both entry into and exit from natural gas production encounter no significant barriers.

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[25] *Statistics of Income,* op. cit., various years.

Professor Hawkins need ont have qualified his observations about ease of entry into the gas producing industry. Both analysis and the factual record urge that neither inherent nor collusive barriers to entry exist in any significant degree. Indeed, the only major deterrent to expansion of the producer population in interstate gas is the artificially low price ceiling on gas imposed by FPC, which in turn unduly restricts the rate of return on investment in reserve additions.

4. Concentration of production sales

Those who view the industry as noncompetitive point to the allegedly high proportion of total sales accounted for by a few companies as evidence of noncompetitive conditions. This sales concentration presumably would permit the major producers to influence the market price of gas, if sold in an unregulated market. The producer industry, so the argument goes, cannot be deemed to be competitive.

Neither the data pertaining to natural gas sales nor economic analysis support this conclusion. In the light of the basic characteristics of the industry the data on sales concentration in no way challenge the view that the industry is highly and effectively competitive.

a. Concentration ratio for natural gas sales.—FPC data pertaining to interstate sales by gas producers show that gas sales by the 8 largest producers accounted for 41.8 percent of the total sales to interstate pipelines reported by producers to the FPC in 1968. In 1971, this share had increased slightly to 45.3 percent.[26]

Among the top eight producers, the spread in market shares was relatively modest. In 1967, the largest producer's share was 7.5 percent while that of the eighth largest was 3.3 percent. In 1968, the spread was slightly larger; the largest share was 8.6 percent and eighth largest was 3.3 percent.[27]

The market share rankings of gas producers change frequently; even among the major producers, market position changes materially within a short period of time. "Over the twelve-year period, from 1957 to 1969, only one producer among the first ten at the beginning of the period kept its rank in terms of sales to interstate pipeline companies. First-ranked Phillips Petroleum gave way to third-ranked Humble Oil and Refining. Five producers passed out of the rank of the first ten." [28] The following chart, excerpted from the testimony of J. Rhoads Foster, graphically illustrates the lack of control by major producers on market position.[29]

This shifting of rank in market shares clearly demonstrates that no one producer has the power to control or even materially to influence either total output or prices. [30] Moreover, the significant and frequent shifting in market shares among major producers makes the interpretations of concentration ratios hopelessly ambiguous.

The more comprehensive data in the Census of Mineral Industries for 1967 show that the eight largest operating companies producing crude petroleum and natural gas (Standard Industrial Code 1311) accounted for 46.4 percent of the value of natural gas shipments.[31] This measure differs only modestly from the concentration ratio derived from FPC data on sales only to interstate pipelines.

To put these natural gas concentration ratios in perspective, they may be compared with the measures of concentration in manufacturing industries. The Census of Manufactures for 1967 shows that for all manufacturing industries, the median concentration ratio was 48 percent. In other words, the natural gas producing industry is below the median level of concentration found in manufacturing. Out of a total of 412 industries, 213 or 52 percent had eight-firm concentration ratios of 46 percent or above.

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[26] Some of the sales reported to FPC by individual companies were made under FPC filings covering other producers; the practice in these cases is to attribute the sale to the filing producer. This treatment of sales implies that the concentration ratio derived from the data overstates the actual concentration of sales, but the extent of this overstatement is not precisely known.

[27] FPC, *Sales by Producers of Natural Gas to Interstate Pipeline Companies*, (1968–69).

[28] Cf. Testimony of J. Rhoads Foster in Permian Basin Area Rate Proceeding, Docket No. AR70–1, pp. 37–39.

[29] Ibid., page 38.

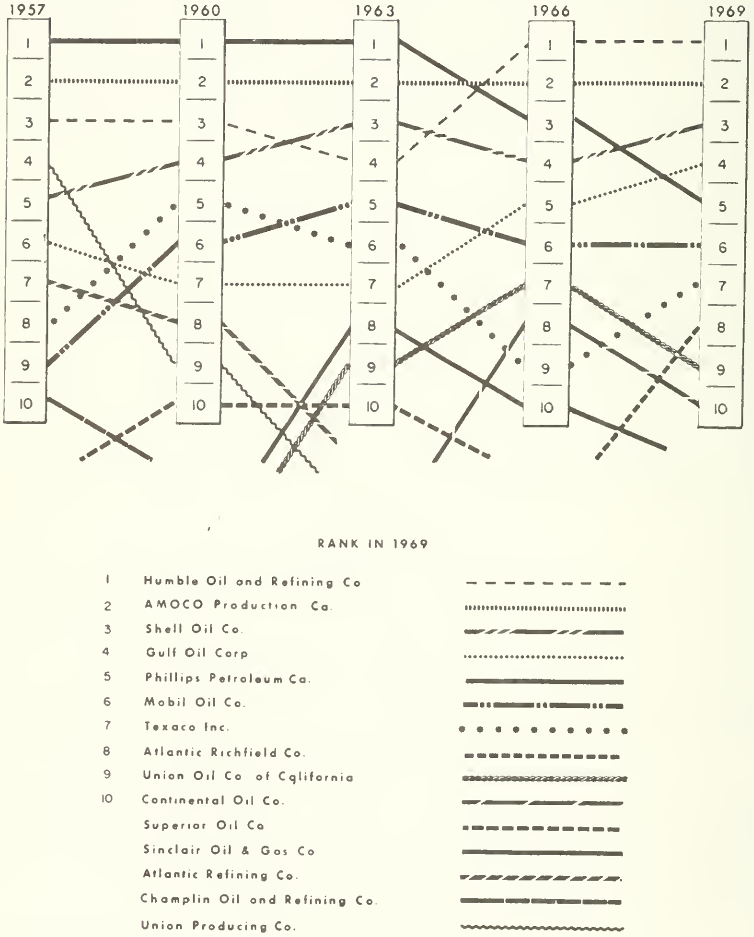
[30] It is also noteworthy that there is no correlation between size of company and interstate gas sales revenues. For example, the average revenue of the second four largest companies is somewhat greater than that of the first four.

[31] Cf. 1967 *Census of Mineral Industries, Crude Petroleum and Natural Gas, Supplement.* The company size rankings are determined by value of shipments of both crude petroleum and natural gas, not natural gas alone. However, the Census data do show gas shipments by the eight firms which have the largest amount of crude petroleum and natural gas shipments combined. Conceivably, the rankings and the concentration ratio could differ if only natural gas shipments were taken into account.

FIGURE 1.

TURNOVER INDICATED BY CHANGE IN RANK AMONG THE TEN LARGEST SELLERS OF NATURAL GAS IN THE UNITED STATES

RANKING ON THE BASIS OF DELIVERIES TO INTERSTATE PIPELINES IN A GIVEN YEAR



SOURCE: Federal Power Commission, Sales by Producers of Natural Gas to Interstate Pipeline Companies.

Eight-firm concentration ratios as great or greater than natural gas appear in a wide range of SIC four-digit manufacturing industries. Among these are: two-thirds of the textile mill products,[32] half of the paper and allied products,[33] chemicals,[34] three of four synthetics industries,[35] three of the four rubber industries,[36] the four glass industries,[37] a majority of the primary metal industries,[38] all five office machine industries,[39] 26 of the 33 electrical equipment and supply industries, including all seven household appliance groups,[40] nine of the fourteen transportation equipment industries,[41] all but two of the eleven industries making scientific instruments and related products,[42] all four tobacco industries,[43] seven out of nine clay products,[44] all four liquor industries,[45] four of the five edible oil producers.[46]

Some of the Census-derived concentration ratios for manufactures are understated, either because the relevant market for a product is much smaller than the national basis the Census uses (e.g. the markets for newspapers, milk, bread, brick products, cement and concrete), or because the four-digit industry contains largely noncompeting products (such as men's dress shirts and nightwear, photographic equipment, or food preparations, not elsewhere classified). Imports also affect the level of concentration, raising it when the importer is an American firm already counted among the eight largest domestic producers in the industry, lowering it otherwise.

These data ambiguities probably do not substantially impact on the concentration ratio for natural gas sales. However, their effect on the measure of manufacturing concentration may be substantial. W. G. Shepherd made such adjustments with respect to the 1966 ratios, based on value added for the top *four* firms, using data from the Annual Survey of Manufactures. He concluded that the weighted four-firm average of all four-digit manufacturing industries was 60 percent, rather than the 39 percent average he derived from unadjusted Census figures.[47] Presumably, if these adjustments were made with respect to the 1967 manufacturing industry data, a very substantially larger proportion of four-digit manufacturing industries would show eight-firm concentration ratios in excess of that derived for natural gas.

A concentration ratio of 46.4 percent, as in the case of natural gas, clearly is neither extraordinarily high nor peculiar to natural resource or other basic industries. Since not less than 52 percent of manufacturing industries (and probably a much higher proportion) have equally high or higher ratios, the natural gas production industry ratio ranks below—probably well below—at least half of the private sector of the U.S. economy. Even if, contrary to fact, these concentration ratios were meaningful measures of competitivness, one would have to conclude that, at worst, the natural gas producing industry was more competitive than half of U.S. business.

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[32] E.g., wool weaving and finishing mills, 62 percent; woven carpets and rugs, 93 percent; thread mills, 81 percent; tire cord and fabric, 96 percent.

[33] E.g., pulpmills, 70 percent; sanitary paper products, 79 percent; building paper and board mills, 69 percent; pressed and molded pulp goods, 87 percent.

[34] E.g., alkalies and chlorine, 88 percent; industrial gases, 84 percent; cyclic intermediates and crudes, 64 percent; inorganic pigments, 78 percent; industrial organic chemicals, n.e.c., 58 percent.

[35] E.g., synthetic rubber, 82 percent; cellulosic manmade fibers, 99+ percent; noncellulosic organic fibers, 94 percent.

[36] E.g., tires and inner tubes, 88 percent; rubber footwear, 75 percent; reclaimed rubber, 96 percent.

[37] E.g., flat glass, 98 percent; glass containers, 75 percent; pressed and blown glass, n.e.c., 83 percent; products of purchased glass, 50 percent.

[38] E.g., blast furnaces and steel mills, 66 percent; primary copper, 98 percent; primary zinc, 90 percent; primary aluminum, 100 percent.

[39] E.g., typewriters, 99 percent; electronic computing equipment, 83 percent; calculating and accounting machines, 90 percent; scales and balances, 72 percent; office machines, n.e.c., 74 percent.

[40] Ranging from 63 percent for electric housewares and fans to 95 percent for household laundry equipment.

[41] Ranging from ship building and repairing, 59 percent, to locomotives and parts, 99 percent.

[42] E.g., optical instruments and lenses, 59 percent; automatic temperature controls, 75 percent; photographic equipment and supplies, 81 percent.

[43] E.g., cigarettes, 100 percent; cigars, 83 percent; chewing and smoking tobacco, 81 percent; tobacco stemming and redrying, 87 percent.

[44] E.g., ceramic wall and floor tile, 76 percent; vitreous plumbing fixtures, 84 percent; porcelain electrical supplies, 70 percent.

[45] E.g., malt liquors, 59 percent; malt, 62 percent; wines, brandy, and brandy spirits, 63 percent; distilled liquor except brandy, 71 percent.

[46] E.g., cottonseed oil mills, 60 percent; soybean oil mills, 76 percent; shortening and cooking oils, 67 percent; vegetable oil mills, n.e.c., 78 percent.

[47] William G. Shepherd, *Market Power and Economic Welfare: An Introduction* Random House (New York, 1970), p. 106.

b. Concentration and competitiveness.—As pointed out later in this discussion, careful empirical investigations show no significant relationship between the degree of concentration and market prices. Moreover, the analytical connection between some measure of concentration and degree of competitiveness has not been established. And the conceptual validity and usefulness of the concentration measures which are typically used is questionable.

None of the conditions required for perfect competition demand that all of the firms in a perfectly competitive industry must be of equal size, i.e., have an equal percentage of output and sales. Indeed, if this were a required condition, one could unequivocally state that no industry could ever be perfectly competitive, unless it could be established that there is some uniquely optimum size of firm for each industry towards which all companies in the industry will tend if the industry is perfectly competitive. It is an observable fact that company size varies in every industry, and that the distribution of companies by size has little if any relationship to industry competitiveness. Moreover, it is observable that unequal size distributions persist with little significant change over many years. These observations strongly suggest that there is no unique optimum size of the firm in any industry and that substantial variation in size is compatible with efficient operation, irrespective of the competitiveness of the industry.[48]

One should expect, therefore, that even in the most nearly perfectly competitive industry, a relatively small proportion of the companies account for a disproportionately large proportion of sales. Data which show the proportion of sales by the top 4, 8, 20, etc., companies do not measure or describe industry competitiveness.

The notion that if there is some significant concentration of the sales in an industry the industry cannot be competitive appears to rest on the assumption that when a few firms account for a relatively large proportion of an industry's sales, they "control" the market, i.e., can determine the total quantity sold and the price of the product. Concentration of sales, although a necessary condition, is not a sufficient condition for such control.

For example, consider a highly competitive industry with no significant barriers to entry, composed of a large number of companies of various sizes, producing an undifferentiated product. Suppose one of the companies produces and sells, say, 20 percent of the total output of the industry. Suppose further that that company seeks to raise the market price of the product by reducing its output and sales. The initial, momentary impact would be a reduction in the quantity supplied and an increase in market price. At the higher market price, however, all of the other companies would seek to increase their output until their marginal costs were again equal to the price. In addition, new companies would enter the industry. The temporary effect would be a reduction in the market share of the large company. With the increased output of the other existing companies and the addition to output by the new companies, total quantity supplied would increase and the market price would fall. As market price decreased, firms would contract output and some firms would leave the industry. This process of adjustment would end when the market price had once more returned to its original level. A symmetrical process would occur if instead the large firm were to attempt to increase its sales by reducing its price. Clearly, the high sales concentration in this case does not necessarily imply any disproportionate control over market results. Sales concentration alone does not suffice; to control market results, the major firms would also have to be able to prevent entry of new firms or expansion of output of other existing firms.

c. Concentration measures.—A number of alternative concepts and measures of concentration have been developed and used in empirical and analytical investigations. The measure most widely used in the United States, and used above for FPC, Census of Mineral Industries, and Census of Manufactures data, is the share of an industry's output coming from the 4, 8, etc., largest firms. Elsewhere, the shares of some other designated number of firms, or the number of firms which account for some designated share, e.g., 80 percent, of the industry's output, is used.[49]

As indicated, the measures most commonly used in the United States is the share of an industry's sales from the 4, 8, etc., largest companies. The interpretation of these indexes as measures of competitiveness, however, is entirely ambigious. For example, suppose that in industry A the first 4 companies account for 15 percent of sales and the next 4 companies for 10 percent, while in industry B, the first 4 companies' share is 14 percent and the next 4 have 12 percent. If the concentration ratio is measured by reference to the first 4 companies, industry A is less competitive than B, but if the first 8 companies are used, industry B is less competitive. Would industry A or B be more or less competitive than industry C in which the largest company has 10 percent of total sales and no other company has more than 1 percent? Presumably, if the first 12, 16, 20, and 50 companies are alternatively used, the competitive rankings of the industries would change with each measure.

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[48] Cf. George J. Stigler, *The Theory of Price* (The Macmillan Company of New York, 1966), pp. 158–160.

[49] Cf. Stigler, *The Organization of Industry*, op. cit., p. 30.

More fundamentally, however, the meaning of any such index is unclear. Consider a specific industry in which the largest company has 8 percent of sales, the next largest has 7 percent, the third has 6 percent, and so on over the first, say, 25 companies, with the remaining, say, 3,000 companies accounting for, 35 percent of the industry's sales. If the industry met all of the other conditions for substantially perfect competition, what significance should be attributed to the fact that the largest company sells 8 percent of the industry's total output? As shown above, if it attempted to control the market price, for whatever reason, its success would be, at best, momentary. To exert control, it would have to engage in collusive action with some other companies in the industry (not necessarily the next several largest). But then it is not market share which indicates the degree of competitiveness; it is, rather, the practical possibilities for undertaking and enforcing collusive arrangements among any of the companies.

The reasoning, then, should run the other way: if there is evidence that an industry is noncompetitive, the conventional concentration ratio conceivably might indicate the *potential* for market control among the first several largest firms. Of itself, however, the concentration ratio is not a reliable indicator of competitiveness in an industry.

Given the narrow range of market shares among the major gas producers (as shown by the FPC data on sales to interstate pipelines),[50] the lack of significant barriers to entry, the large number of producers, and the lack of significant product differentiation, it is difficult to believe that any one company could exercise any significant control in an unregulated natural gas market.

C. Evidence from the intrastate market

The existence of the unregulated intrastate market alongside the regulated interstate market, both supplied by producers often selling in both markets, affords an opportunity to test the opposing propositions about the competitiveness of the gas producing industry. Surely if the industry is "monopolistic" or highly noncompetitive, its performance in the unregulated intrastate market should cast up evidence to this effect. In fact, however, such data as are available with respect to the intrastate market strongly affirm precisely the opposite conclusion, viz., the industry is highly and effectively competitive.

Two separate tests, each solidly based on fundamental analytical propositions, are possible with the data available for the intrastate market. The first of these tests is a comparison of gas prices in the intrastate and interstate markets in given regions. As is shown below, economic analysis leads to the conclusion that prices in the two markets should, in general, be quite close if the gas producing industry is highly and effectively competitive; if the industry, rather, is highly noncompetitive, substantial differences between the prices in the two markets should generally prevail.

The second test is a comparison of the spread among gas prices in the intrastate market with the spread among costs of production of the gas. If the industry is highly and effectively competitive, the dispersion in prices in any region in the intrastate market should be substantially less than the dispersion in costs. If the industry were significantly noncompetitive, on the other hand, there should be much less of a difference between the respective dispersions.

1. Comparison of interstate and intrastate prices

The significance of this test derives from some fundamental principles of economics concerning the pricing behavior and results of companies in competitive compared with noncompetitive industries.

Any producer-seller in any kind of market who maximizes his profits produces and offers for sale that quantity which just adds as much to his cost as to his revenues. Clearly, if the company were to produce and sell, say, 1001 units instead of 1000 units and if producing the additional quantity were to add less to the company's cost than to its revenues, it would pay the company to produce the larger quantity. By the same token, if producing and selling, say, 1011 units instead of 1010 were to add more to the company's cost than to its revenues, it would not pay to produce and sell the larger quantity. The best quantity to produce and sell, therefore, would be more than 1000 and less than 1011, and the company must seek out that one best price and quantity, given the conditions which determine its costs and the demand for its products or services.

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[50] Cf. Hawkins, op. cit., pp. 141–145.

If the perfectly competitive market in which no one producer-seller's actions materially affect the market price, the additional revenue obtained from selling one more unit of the product or service is equal to the market price of the product or service. For a company in that kind of market, the profit-maximizing output is that quantity such that producing and selling one less unit would subtract less from cost than the market price and producing and selling a quantity one unit more would add more to cost than the market price. In short, the profit-maximizing output is such that its marginal cost is just equal to the price.

In the monopolistic case, since each different amount of the product or service can be sold by the company only at a correspondingly different price, the change in the monopolist's revenues resulting from producing and selling a given quantity rather than one unit more or less is not equal to the price. Thus, suppose demand conditions are such that he can sell 1,000 units at, say, $100 a piece (total revenue=$100,000), but if he offers to sell 1010 units he can obtain a price of only $99.90 (total revenue=$100,899). Then, selling the additional 10 units adds $899, or $89.90 per additional unit, to his total revenue, not $1000 for $999. The additional revenue per unit, $89.90, is less than the price, $99.90, at which 1010 units can be sold. The addition to his total revenue from selling the larger rather than the smaller quantity—his marginal revenue—in other words, is less than the additional quantity times the new price at which the total quantity, 1010 units, can be sold.

Just as in the perfectly competitive market, in the perfectly monopolistic market there is some one output and price at which the company maximizes its profits, given the company's costs for producing and selling various amounts of the product or service and given the conditions of demand. To repeat, the condition for profit maximization is that the company produce and sell that quantity of its product or service the *marginal* cost of which is just equal to the marginal revenue. In the perfectly competitive market, since marginal revenue equals price, the maximizing rule may be restated that the company produces that quantity the *marginal* cost of which is equal to the price. In the monopolist's case, at the profit maximizing output *marginal* cost is less than price.

As noted earlier, few industries meet the conditions which delineate either perfect competition or perfect monopoly. Most industries, however, incline much more toward the perfect competition end of the spectrum than toward the monopolist.[51] The monopolist, to repeat an earlier observation, must have exclusive control over one or more of the inputs essential to the production or sale of his output, i.e., he must be able to exclude completely any other company from producing and selling a reasonably close substitute product or service. While in most industries, companies attempt to differentiate their output from that of other companies, there are few instances in which that product differentiation is—or has been—subsantial, at least for any length of time. With few significant exceptions, if any one company in an industry can differentiate its product, other companies can undertake similar product differentiation to eliminate or greatly reduce the competitive advantage of the first company. As a consequence, the companies tend to offset each other's product differentiation efforts and the demand advantages which might be realized if only one or a few companies differentiated output. In most industries, therefore, close substitutability among the various companies' products or services is the rule, and substantial uniqueness is the rare exception.

The significance of this observation lies in the fact that the greater the number and the closer the substitute products, others things being equal, the more price elastic is the demand for the company's output.[52] Moreover, the more elastic the demand, the closer is marginal revenue to price.[53] Thus, in an industry in which there are many substitutes for any one company's output or even a few very good substitutes for any one company's product or services, the elasticity of demand facing any one company is likely to be high.[54] If any one such company produces its profit-maximizing output, i.e., that output the marginal cost of which is equal to the marginal revenue, then its price is likely to be close to a perfectly competitive market price.

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[51] Cf. Milton Friedman, *Capitalism and Freedom* (University of Chicago Press, 1964), pp. 121–122.

[52] The substitutes need not be products with basically similar physical characteristics. Soft drinks, fruit juices, coffee, tea, milk, and alcoholic beverages are substitute products in varying degree. In a free market, more or less close substitutes for natural gas include, e.g., oil, natural gas liquids, hydroelectricity, and coal.

This is, indeed, the technical meaning of the phrase "effective competition." Conditions of perfect competition are seldom perceived in the real world—some product differentiation exists in most markets—but for numerous industries the conditions of demand facing the firms differ only modestly from those they would face if the market were perfectly competitive. The resulting market solutions, therefore, are close to those that would prevail under perfect competition.

With these analytical propositions in mind, suppose, to begin with, that sellers in the intrastate market were, in fact, highly monopolistic. Suppose further that the price of gas set by the FPC in the *interstate* market is at least as high as that which would be required to clear both the interstate and intrastate markets, if the industry were highly competitive. Then for the monopolistic producers, who sell in both markets, the demand for gas in the regulated market would be infinitely elastic at the regulated price (up to that quantity of gas for which interstate buyers would only pay a price less than the regulated price). In the unregulated market, however, the demand for gas as seen by the producers would be less elastic, since changes in the quantity offered for sale by any one such monopolistic producer would affect the market price; for any one such producer, therefore, each different quantity of gas could be sold only at a different price. The marginal revenue for any quantity of gas sold in that market, therefore, would be less than the price for that quantity. In order to maximize profits, the monopolistic producers would offer for sale in each market that quantity for which the marginal revenue is the same in both and is equal to the marginal cost of the total output. Since marginal revenue equals price in the regulated market and is less than price in the unregulated market, the price in the latter necessarily would exceed that in the former, if the producers behave like profit-maximizing monopolists.[55]

On the other hand, suppose that the industry is highly and effectively competitive. Under this assumption, the demand facing *each producer* in the unregulated market will be highly elastic—approaching infinity—even if the *market demand* is highly inelastic. Then each producer will offer for sale that quantity the marginal cost of which is equal to the regulated price in the interstate market and equal to marginal revenue in the intrastate market. Since marginal revenue will be very nearly equal to price in the unregulated market and since marginal revenue in each market must be equal and the same as the marginal cost for each producer for his total output, the price in the unregulated market will be little, if any, higher than in the interstate market. In effect, the FPC ceiling on the interstate price imposes a ceiling as well on the intrastate price.[56]

This analysis is graphically illustrated in Figure 2. D_U represents the market demand for gas in the unregulated, intrastate market, D_R is the market demand for gas in the regulated interstate market, and D_T is the total demand for gas, taking both markets together. P_R is the price of gas set by the FPC in the interstate market. MC is the sum (horizontal) of the marginal cost schedules of all the producers, who sell gas in both markets. If the industry is perfectly—or nearly so—competitive, MC is the industry supply schedule.

The demand for gas facing any one company in the interstate market is the horizontal dotted line at P_R, and the marginal revenue for any output, as seen by any one company, is also P_R (up to the quantity Q_R). If the industry is effectively competitive, the demand for gas as seen by any one company in the unregulated market will also be a virtually horizontal line at the prevailing

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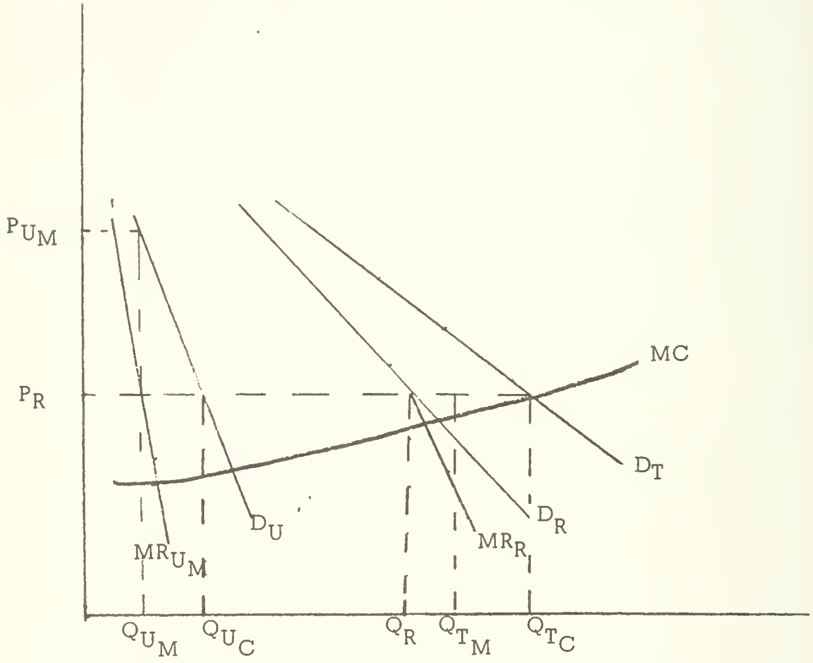
[53] Notationally, marginal revenue $= p(1+\frac{1}{7})$, where p is the price and 7 is the elasticity of demand (with a negative value). Where demand is infinitely elastic, $\frac{1}{7}$ is infinitesimally small, and marginal revenue equals price. The smaller the elasticity of demand, clearly, the greater is the excess of price over marginal revenue.

[54] Indeed, substitutability is one of the reasons that the number of firms in an industry or their concentration is often a misleading indicator of the industry's competitiveness. Cf. George J. Stigler, *The Theory of Price*, op. cit., pp. 197–199.

[55] Cf. Stigler, *Theory of Price*, op. cit., pp. 209 ff., for a discussion of discriminatory pricing by a monopolist. In effect, FPC price ceilings face each producer with an infinitely elastic demand situation in the interstate market, up to that quantity of gas for which buyers are willing only to pay less per MCF than the ceiling price.

[56] Cf. Milton Russell, "Producer Regulation for the 1970's," in Keith C. Brown, ed., op. cit., pp. 224ff.

FIGURE 2



market price. Since (a) marginal revenue for each producer must be equal in both markets, (b) marginal revenue must be very nearly equal to price in the intrastate market if the industry is effectively competitive, and (c) marginal revenue in the interstate market equals the regulated price, P_R, the price in the intrastate market must be very nearly equal to that in the interstate market. Then, to maximize its profits, each company offers for sale that quantity the marginal cost of which is equal to the marginal revenue which is equal to P_R, the regulated price, if the industry is effectively competitive. In the intrastate market, the total quantity offered for sale is Q_{U_C}, in the interstate market, sales are Q_R, and the total quantity offered for sale is Q_{T_C}, which is equal to the sum of the quantities demanded in both markets at a price of P_R.

On the other hand, if the market is highly noncompetitive, marginal revenue as seen by each company in the unregulated intrastate market is less than, rather than equal to, the price at which any given quantity can be sold by each company. To maximize its profits, each company will sell that quantity in each market for which the marginal revenue is the same. Since marginal revenue, is P_R in the interstate market, each company will sell that quantity in the intrastate market for which the marginal revenue is also equal to P_R. In Figure

2, the quantity in the intrastate market for which the marginal revenue is equal to P_R is Q_{U_M} which is sold at a price of P_{U_M}, substantially higher than the regulated price P_R. Total sales in both markets combined are Q_{T_M}, equal to the sum of Q_{U_M} and Q_R.

For the period in the mid-to-late 1960's for which price data on intrastate sales are available and prior to the sharply increasing shortages, intrastate prices were very nearly the same as interstate prices. In general, the difference between the prices in any given region was in the neighborhood of one cent per MCF. (See Table 2.)

TABLE 2.—INTERSTATE AND INTRASTATE GAS PRICES IN CENTS PER THOUSAND CUBIC FEET, SELECTED REGIONS 1966–69

Region	1966		1967		1968		1969	
	Weighted average[1]	Range	Weighted average[1]	Range	Weighted average[1]	Range	Weighted average[1]	Range
South Louisiana:[2]								
Offshore Interstate	19.29	17.00–19.50	20.18	18.50–24.00	20.66	18.50–21.25	21.05	19.50–22.25
Onshore: Interstate	20.42	13.30–21.25	20.64	15.00–21.25	20.91	17.50–22.00	21.21	7.50–22.75
Onshore intrastate	19.58	14.00–22.30	19.58	16.50–24.45	20.21	14.75–30.00	20.32	19.50–23.68
Texas Gulf Coast:[2]								
Interstate	15.59	12.00–17.00	15.70	14.25–17.00	16.89	14.25–17.80	17.71	14.00–21.25
Intrastate	16.10	11.00–18.00	17.47	10.00–20.00	17.15	13.75–19.50	18.94	12.00–21.00
Rocky Mountain:[2]								
Interstate	13.21	8.93–16.00	14.45	8.93–16.00	14.03	8.93–15.00	14.48	8.93–17.55
Intrastate	15.09	11.51–16.90	----------	----------	17.29	17.00–17.50	11.57	9.75–12.00
Permian Basin:[2]								
Interstate	16.41	12.50–16.66	16.92	14.50–17.50	16.30	14.50–17.50	16.73	14.50–18.00
Intrastate	16.97	13.65–19.25	16.28	15.24–22.00	17.11	13.00–18.00	18.33	12.00–20.25

[1] The term weighted average is defined as the sum of the annual volume of each contract multiplied by applicable rate of each contract divided by the total annual volume of all contracts dated in the respective year.

[2] Prices are initial contract rates except for South Louisiana, which includes tax reimbursement. Prices were reported at, or converted to, pressure of 14.65 lb./in.^{2}a except for South Louisiana, which is based on pressure of 15.025 lb/in^{2}a.

Sources: Interstate: Foster Associates, Inc., from data supplied to Federal Power Commission. Intrastate: Federal Power Commission, Docket No. R–389A, "Initial Rates for Future Sales of Natural Gas for All Areas," Sept. 9, 1970.

This result is sharply at odds with those which would have occurred if producers had operated noncompetitively in the intrastate market. On the other hand, they are precisely the results one would expect if the gas production industry is highly and effectively competitive. The evidence for this period from the intrastate market strongly reaffirms the conclusion that the industry is highly and effectively competitive.

Consider, next, the situation when the FPC ceiling price is less than that required to clear the total regulated and unregulated market if the industry operates competitively. Moreover, assume that the increase in demand (relative to the increase in supply) which is responsible for this situation occurs in both markets. Under these conditions, price will rise in the intrastate market, irrespective of whether the industry is highly monopolized or highly competitive. The increase in price in the unregulated market will, moreover, induce a reallocation of sales, to the extent that existing contracts permit, from the interstate to the intrastate market. This shift will occur irrespective of the competitiveness of the industry. The price increase would also induce producers to attempt to add to their reserves, hence to increase their supply, at a faster pace. If the industry operated subject to constant costs, a higher price would prevail in the unregulated market until the additions to supply, all of which would be allocated to that market, were sufficient to bring the unregulated price down to the ceiling price in the regulated market, assuming the industry is competitive. If it were not competitive, on these assumptions the allocation of additional supplies to the unregulated market would continue until the marginal revenue to the monopolistic producers in that market was equal to the ceiling price they obtain for their gas in the interstate market.

On the other hand, since the industry, in fact, operates subject to increasing costs, the adjustment process will involve a continuing shift of sales from the interstate to the intrastate markets, so long as the ceiling price on interstate gas sales is not increased. This result will not depend on the competitiveness of the industry.

In view of the continuing and accelerating increases in demand and in costs and the continued imposition of ceilings on both new gas and flowing gas in the interstate market, it is not possible to draw any definitive conclusions about industry competitiveness, parallel to those for the mid 1960's, from comparison of current or very recent market conditions. Clearly the adjustment process described above is well underway. The market solutions toward which those adjustments are heading will depend heavily on whether the FPC continues to impose ceiling prices below the market-clearing price.

On the other hand, the findings from the earlier period are so urgently persuasive that the gas producing industry was highly and effectively competitive in the unregulated intrastate markets that any assertion that it no longer is should require the most rigorous proofs. At the very least, it would be necessary to explain why the industry had changed in so short a period of time from a highly effective competitive one to a highly noncompetitive one.

2. Comparison of intrastate prices and costs

As noted, under conditions of "effective competition," the differences among the competing firms in the level and elasticity of demand are likely to be modest. On the other hand, although market forces themselves tend over time to eliminate *differences in the cost* structures among the competing firms, at any given moment in time these differences are likely to be considerably more substantial than the *differences in demand*.[57] Accordingly, a cross-section of the companies in any effectively competitive market at any given time should reveal a significantly greater dispersion in their costs of producing and selling the quantities of the products or services they offer for sale than in the prices they receive for their products and services. In other words, prices among such companies will not necessarily be identical, but they will be more closely clustered than their average costs of production and sale.

In contrast, in the highly noncompetitive industry, differences in demand conditions facing the companies should be substantial. Cost structures, at any given time, also should be expected to differ materially among the companies, just as in the case of a perfectly competitive industry. Assume that the dispersion in costs among producers is of the same magnitude, or nearly so, irrespective of whether the industry is highly competitive or highly noncompetitive. Then if the industry is noncompetitive, there should be much less of a difference between the dispersion in prices and the dispersion in costs observable in an unregulated market.

A comparison of the high, low, and weighted average prices of intrastate sales of gas contracted for in 1969 with the corresponding range of partial costs of producers selling gas in the instrastate (and interstate) markets is shown in Table 3.[58] Clearly, the range in intrastate sales prices (cents per MCF) in the Southern Louisiana, Rocky Mountain, and Permian regions is less than the range in the costs shown for that gas.

These test results strongly support the conclusions to be drawn from the first test, pertaining to the similarity of gas prices in both regulated and unregulated markets, viz., the natural gas producing industry is highly and effectively competitive. Taken together, these test results impose an enormous burden of proof, both analytical and factual, on those who assert that the industry is significantly noncompetitive.

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[57] Indeed, even among perfectly competitive firms significant cost differences should be expected, except under conditions of long-run equilibrium.

[58] Cost data reported to the FPC are for total operations, without distinction between interstate and intrastate sales. This is unavoidable since both markets are often served by the same leases.

TABLE 3.—DISPERSION OF PARTIAL GAS COSTS[1] AND PRICES—SELECTED REGIONS, 1969

[In cents per thousand cubic feet]

Region	Range of elements of gas production costs	Range of intrastate sales price
Southern Louisiana	1.36–93.73	19.50–23.68
Rocky Mountain	1.64–14.45	9.75–12.00
Permian Basin	1.67–518.82	12.00–20.25

[1] Costs used in the arrays consist of direct lease operating expenses and depreciation, depletion, and amortization reported on the 3 gas well gas lease classifications of gas only, gas condensate with lease separation, and gas condensate with no lease separation. While the items of costs used do not represent all cost data reported in the cost questionnaires, they do represent the major operating costs which can be identified with gas well production without allocation.

Other major items of costs reported in the cost questionnaires such as exploration and development costs, investment in leases and equipment, and royalties generally require allocation to gas well gas in order to derive total costs. These costs, therefore, are not included here. Such allocations and derivations are subject to difference of opinion on methods to be employed. Consequently, any array of individual company costs would be subject to question on allocation bases. To avoid that question only the selected costs identifiable directly with gas well gas production reported here have been used.

While these arrays do not represent total company gas well gas costs or a proxy, they nevertheless do indicate the range of costs experienced by individual companies in the industry.

Source: Cost questionnaires filed by producers with, and available at, the Federal Power Commission.

III. COST-BASED REGULATED PRICES VS. DEREGULATED MARKET PRICES

The most vigorously urged justification for FPC regulation of the price of natural gas is based on the assertion that the gas producing industry is highly noncompetitive.

The line of argument that has been advanced to link the degree of competitiveness of the natural gas industry to the "need" for regulating the price of gas, to the specific method for determining the regulated price, to the existence of a natural gas shortage, and to the consequences of deregulating the price of gas is murky and poorly articulated. According to this argument, regulation is necessary ". . . because, in fact, the prevailing conditions either preclude or inhibit the attainment of a competitive market solution. In such circumstances, as in the natural gas industry, there are structural conditions which, if left unregulated, would produce a monopolistic rather than a competitive end result."[59] It is further argued that the competitive end result is a market price equal to the cost of production: "The elementary fact . . . is that the new gas cost is the competitive market price. The hallmark of a competitive industry is a level which tends to equate resources and costs (including a fair return) . . . The fact that price equals cost in a competitive market is the reason why cost determinations are fundamental to efficient regulatory ratemaking."[60] In noncompetitive industries, on the other hand, it is argued that firms with monopoly power contrive artificial scarcities of their product so as not to spoil the price they can get. Such firms, allegedly, contrive to keep price above marginal cost because in that way they maximize profit.

The line of argument, thus, seems to be that the shortage of gas results from the alleged "fact" that gas producers are monopolists, that their pricing behavior differs from that of competitive firms, that the prices they would set if unregulated would be based on contrived shortages, and that if gas prices are established at the level of gas costs, regulation should not be blamed for the shortage. It is further argued that, given these "facts", deregulation of interstate gas prices would result in prices in excess of a "just and reasonable" price, according windfall profits to producers and impairing the interests of consumers.

This line of argument raises serious issues of both fact and analysis. In Section 11, above, the assertion that the gas producing industry is noncompetitive was examined and found to be unjustified. On the contrary, the characteristics of the industry and market results attest to the fact that it is highly and effectively competitive. But quite apart from those findings, the basic premises upon which the arguments for regulation are based are subject to serious challenge. These premises are that (1) prices set by the FPC equal to estimated costs of production are the same as the market prices which would prevail in competitive markets; (2) cost-based regulated prices are in no way responsible for the existing and prospective gas shortages; and (3) the price increases which would result if interstate gas were deregulated would be excessive, would provide windfall profits for producers, would injure consumers, and would not be necessary to deal with the gas shortage.

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[59] Cf. Wilson, op. cit., p. 12.
[60] Ibid., pp. 14–15.

A. Is a perfectly competitive market price equal to the cost of production?

It is widely believed that regulation by a public authority of the price of a commodity or service aims at achieving the results which would prevail if the commodity or service were sold in a perfectly competitive market.[61] Moreover, the competitive market price which regulation ostensibly aims at reproducing is asserted to be equal to the cost of producing the commodity or service.[62]

Whether regulatory agencies generally do, in fact, consciously seek to set competitive market prices is a question which must be reserved for some other discussion. But if the FPC does indeed aim at the competitive market solution in regulating the price of gas, the question is whether the regulated price should be set equal to the estimated cost of production,[63] i.e., is a competitive market price equal to the cost of producing the product or service?

The basic analytics of the competitive market solution were delineated in Section II of this discussion. To repeat the central points, any company operating in a perfectly competitive market produces and offers for sale at any time that quantity of its product or service the marginal cost of which is equal to the marginal revenue, which in perfect competition is equal to the prevailing market price. In regulatory practice, however, it is not the *marginal* but the *average* cost to which the regulated price is equated. The average cost of that best quantity for the company to produce and sell, however, will coincide with marginal cost only under two limiting circumstances.

One of these circumstances is that over the range of output in which the company's production occurs, average cost is the same at every different quantity produced. Thus, if the company's output may range from, say, 1000 to 1500 units per operating period, and if the average cost of 1000 units, 1500 units, or any other quantity between 1000 and 1500 units is the same, marginal cost will also be the same as average cost over this output range. But if this were the case for any significant number of companies in the industry, output would be indeterminate and no stable *market* price would be achieved. Any one such company could find any best quantity to produce only if its average cost (equals its marginal cost) throughout its range of production possibilities were exactly equal to market price; but even under these conditions the company would find no best output between 1000 and 1500 units, in the example above. Any random change in output within this range by any substantial number of companies would clearly affect the market price, requiring all of the companies again to change output. In short, under these circumstances, the quantity produced and offered for sale by any company and by all companies, hence market supply, would fluctuate widely and frequently as would the price of the product or service. No stable market solution of price and quantity would be achieved.

In fact, price movements of this character are not typically found in any market. This limiting circumstance therefore, may be dismissed on factual as well as analytical grounds.

The other limiting circumstance in which the average cost equals the marginal cost of the best quantity of the product for the company to produce is when long-run equilibrium has been attained in the industry. The principal conditions for long-run equilibrium is that when each firm is producing its best output, i.e., that quantity the marginal cost of which is equal to marginal revenue, the industry as a whole earns the same rate of return as that generally prevailing in all industries. For this condition to be satisfied, the average cost, including the average rate of return on the capital committed to the industry must be equal to the market price. Since marginal cost must also be equal to the market price, marginal cost must also equal average cost. If these conditions were to obtain, there would be no incentive for firms generally either to leave or to enter the industry, and the market would clear at the prevailing price, i.e., the quantity of the product or service offered for sale at that price would equal the quantity buyers would purchase at that price.

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[61] Cf. Wilson, op. cit., p. 12: ". . . the competitive price should be the regulatory standard. Virtually every undergraduate textbook on regulatory economics makes precisely that point in the opening chapter."

[62] Ibid., pp. 14–15: ". . . the new gas cost is the competitive market price. The hallmark of a competitive industry is a price level which tends to equate revenues and costs (including a fair return) . . . the fact that *price equals cost* in a competitive market is the reason why cost determinations are fundamental to efficient regulatory ratemaking."

[63] To repeat, such estimates involve highly arbitrary allocations of overhead and joint costs.

Failing these conditions, there is an incentive either to commit additional production inputs to the industry if its profit rate exceeds that generally available, or to withdraw production resources, if the profit rate is less than that generally prevailing. If the profit is above average, more production resources are added and supply increases. The price of the products will fall, at least relative to what it otherwise would have been. In addition, the costs of the production inputs, hence costs of production will rise, as firms in the industry attempt to bid away productive services from other industries. If the profit rate is below average, the exodus of production inputs from the industry reduces the market supply and raises the price of the industry's output. Moreover, input prices and costs of production will fall. In either case, these adjustments will continue until it no longer pays to shift resources from one industry to another. When the adjustments come to a halt, then, the price of the product is just equal to its average cost, including as one of the costs the rate of return on investment generally available throughout the market.[64]

These general equilibrium conditions hold, irrespective of the degree of competitiveness of the industry. The limiting case is that in which a company or a combination of companies can both bar the entry of new companies into an industry with a rate of return in excess of the generally prevailing market rate and also fails to expand its own investment.

In the long run, therefore, prices tend toward equality with average cost, including a "normal" rate of return, irrespective of the degree of competitiveness of the market.[65]

Except under conditions of long-run equilibrium, however, marginal cost and average cost are not the same. If average cost increases with increases in output, marginal cost will exceed average cost; if average cost falls as output increases, marginal cost is less than average cost.[66] Since the company produces and sells that quantity the marginal cost of which equals the market price (in the perfectly competitive market), when average cost is rising, the price will be greater than average cost and the company will earn a profit, i.e., an amount greater than the generally prevailing rate of return. If at the company's best output its average cost is decreasing, marginal cost is less than average cost, and the company will suffer a loss. It will earn less than the generally prevailing rate of return.

The competitive market solution, therefore, is a price which is greater or less than the average cost of the quantity produced and sold *except under conditions of long-run equilibrium*. It is useful, for many analytical purposes, to spell out the conditions for long-run equilibrium, not because the economy as a whole or any market therein has actually attained these conditions in the dynamic real world, but because delineating these conditions suggests the kinds of adjustments firms, industries, and sectors tend to make.

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[64] This rate of return may in fact differ from industry to industry because of differences in the risk of investment in each. The new price, after the adjustments are completed, will be lower than, the same as, or higher than before depending on whether the industry is characterized as a decreasing, constant, or increasing cost industry. A decreasing cost industry is one in which the minimum average cost from a given scale of plant declines as the scale of plant is increased. An increasing cost industry experiences a rise in the minimum average cost as scale increases. Natural gas production is in general subject to increasing costs, i.e., the cost per MCF of gas incurred in the development of additional reserves increases as new reserves are added.

[65] Equality of price and average cost is conventionally identified as the principal condition of long-run equilibrium in perfect competition. As shown, however, this general equilibrium condition is not restricted to the case of perfect competition. On the contrary, general equilibrium analysis shows that, other things being equal, all industries in the long run tend toward satisfying that condition. The distinction between the market price situation of competitive and noncompetitive industries disappears in the condition of long-run equilibrium. Cf. Eugene F. Fama and Arthur B. Laffer, op. cit.

[66] See Stigler, *The Theory of Price*, op. cit., Appendix B, pp. 337–338, for a simple formal statement of the relationships among total, average, and marginal quantities. The common sense of the propositions is readily illustrated by simple arithmetic example: Suppose the total cost of producing 10 units of a product is $100 and the total cost of producing 11 units is $121. The average cost of 10 units is $100 ÷ 10 = $10; the average cost of 11 units is $121 ÷ 11 = $11; the marginal cost of producing 11 units instead of 10 is $121 − $100 = $21, obviously more than the average cost of 11 units. Alternatively, suppose that the total cost of 11 units were $109 instead of $121. Then the average cost of 11 units would be $109 ÷ 11 = $9.91, and the marginal cost of 11 units would be $109 − $100 = $9.00, less than the average cost.

Long-run equilibrium, however, is hardly a normal or usual state of affairs in the dynamic real world. The mere fact of an observed increasing market demand for a product or service is sufficient to establish that market conditions are other than long-run equilibrium (unless it can be shown that the affected industry had fully and correctly anticipated the increasing demand and had scheduled and effectuated instantaneous adjustments thereto, a virtual impossibility).

Any assertion that the cost of gas is the competitive market price is simply, unmistakeably wrong. It is wrong in the context of the rudimentary theory of competitive price. And it is wrong as a characterization of the real world state of affairs. And it is wrong irrespective of one's belief as to the competitiveness of the gas producing industry.

B. Are cost-based regulated prices responsible for the gas shortage?

As the preceding discussion shows, a cost-based regulated price is not the competitive market price, except in the unreal case of long-run equilibrium. But the problem with cost-based price regulation is not merely this conceptual frailty. Far more serious is the fact that cost-based price regulation is likely to result in failure of the market to perform its essential functions efficiently. In a word, such price regulation is likely to preclude market clearing, resulting either in surpluses or in shortages of gas.

The analysis may be presented diagramatically. In Figure 3, let MC be the sum of the marginal cost schedules of the gas producing companies, assuming the industry is effectively competitive, or the marginal cost schedule of a monopolistic producer. Let D represent the market demand for gas, and let MR represent the marginal cost of varying quantities of gas if the industry is monopolized. If the industry is effectively competitive, the unregulated price will be P_1, at which the quantity supplied will be Q_1. On the other hand, if the industry is monopolized, the quantity supplied will be Q_2, which will be sold at a price of P_2.

Now suppose that FPC fixes the price of gas at what it deems to be the average cost of gas production. If it believes that cost to be anything less than P_3 and therefore sets the price below P_3, the quantity supplied will be less than Q_2, i.e., less than the unregulated monopolist would offer, irrespective of whether the industry is effectively competitive or monopolized. Clearly, at any price fixed below P_3, an enormous "shortage" will exist, i.e., the quantity offered for sale will be far less than the quantity demanded at that price.

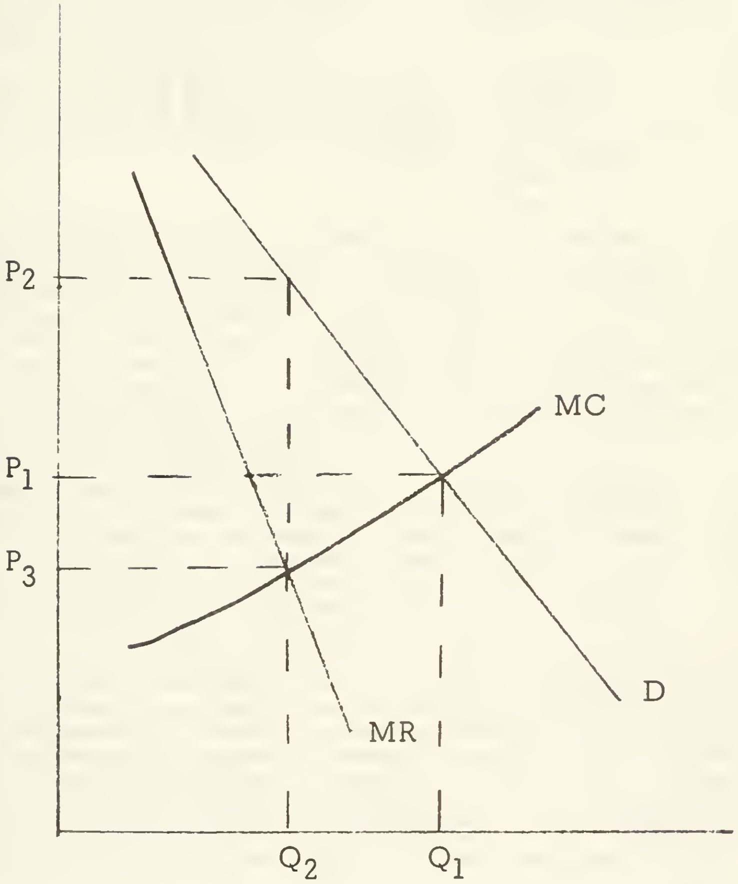
If FPC sets the price above P_3 but below P_1, the quantity supplied will be greater than that which would be offered if the industry were monopolized, but less than that which would be offered in the effectively competitive market. In either case, a shortage would exist, i.e., the quantity supplied would be less than that demanded at the fixed price.

If FPC sets the price above P_1, a surplus would temporarily develop, i.e., the quantity demanded at the fixed price would be less than the quantity supplied, again irrespective of the competitiveness of the industry. In time, however, prices would tend to sink below the FPC ceiling and output would decline, as a result of reduced exploratory effort.

Clearly, if FPC regulates the price of gas, the market will clear only if the price is fixed exactly at P_1. At any other price, either a shortage or surplus will exist, irrespective of whether the gas producing industry is highly monopolistic or effectively competitive. But since the price fixed by FPC ostensibly is equal to the average cost of gas, price regulation will clear the market only if, by pure chance, the average cost is deemed by the FPC to be precisely P_1.

The enormity of the difficulties facing FPC in regulating the price of gas is difficult fully to comprehend. Even if all the cost elements could be accurately and unambiguously determined by the FPC, it would still face the impossible task of determining the correct quantity of output the cost of which is to be determined in order to set a price which will clear the market. In other words, it would have to know the marginal cost of every conceivable, different output, to find that output the marginal and average costs of which are the same, and to determine that at the fixed price equal to that average and marginal cost, the quantity of gas purchasers would want to buy is just equal to the quantity producers would offer for sale. It boggles the mind to assume that the FPC—or any regulatory agency—is capable of making the required determinations.

FIGURE 3.



It cannot be emphasized enough that the quantity, cost, and price determinations by FPC have to be such as to clear the market, unless the FPC or some other public body is to be given the responsibility for allocating the available quantity without reference to demand conditions—how much of the product or service all of the various buyers want to purchase at that price. But as shown, if the price the FPC sets is equal to "the" cost of production, the market will not clear, except if the industry is in long-run equilibrium and if the FPC happens by purest chance to set the price at the market-clearing, long-run equilibrium level.

Clearly, irrespective of whether the industry is competitive or noncompetitive, the task of price regulation imposed on the FPC is impossible to discharge efficiently. To do so, FPC would have to have precise knowledge both about the market demand for gas and the marginal costs of production for every producer. Moreover, even if by pure chance the price fixed by the FPC today clears today's market, changes in demand and in costs will make that price invalid as those changes occur. Effective, i.e., market-clearing, price regulation, therefore, requires perfect forecasts by FPC of changing cost and demand conditions.

It must surely be evident that FPC has seriously underestimated both the increase in demand and the increase in the costs of gas production. As noted earlier, the industry is appropriately characterized as one of increasing costs. Efforts to increase gas supply by the addition of reserves result in sharply rising average costs. Taken together with the rapidly accelerating increases in the demand for gas, these factors have called for substantial increases in gas prices if shortages were to be averted. FPC ceiling prices, no matter how determined, have fallen far short of those required to clear the market.

Both abstract and empirical analyses[67] leave no room for doubt that since gas prices were established by the FPC at the level of gas costs, regulation must be blamed for the gas shortage that has developed. Moreover, regulation *per se* is responsible for the shortage, entirely irrespective of the degree of competitiveness of the regulated industry.[68]

C. Deregulation and price changes

One of the principal objections voiced against deregulating the price of natural gas in order to deal with the gas shortage is that since the industry is "monopolistic," the price increase resulting from deregulation would provide "windfall" profits to producers.[69] The implications in this objection are either that price increases will result from deregulation only because the industry is (allegedly) monopolistic, or that the price increases will be higher because the industry is allegedly monopolistic than they would be if instead the industry were competitive. Since the industry is monopolistic, so the argument goes, the price increases will afford "windfall" profits to the producers; these windfalls, presumably, would not be realized if the industry were competitive. There is, moreover, a further implication that "windfalls" are intrinsically objectionable.

1. *Deregulation, price changes, and the competitiveness of the industry*

The argument that the price of gas must continue to be regulated in order to avoid excessive price increases and windfall profits for allegedly monopolistic producers appears to stem in large part from misapprehensions about price behavior and price results in competitive and noncompetitive industries. These misapprehensions lead to the conclusions, which cannot be substantiated either by analysis or facts, that (a) prices in noncompetitive markets are systematically higher than those in competitive markets, and (b) when demand increases, prices rise more in noncompetitive than in competitive markets.

a. Market prices and the competitiveness of markets.—Does a company's price behavior differ systematically with respect to the degree of competitiveness of the market in which it operates? As noted earlier, any producer-seller in any kind of market who maximizes his profits produces and offers for sale that quantity which just adds as much to his cost as to his revenues. The condition for profit maximization, in other words, is that the company produce and sell that quantity of its product the *marginal* cost of which is just equal to the marginal revenue. Differences in market competitiveness, therefore, are not relevant factors influencing pricing behavior. Both the perfectly competitive company and the monopolist, insofar as each is a profit maximizer, are guided, consciously or not, by the same rules. Contrary to a popular notion, the profit-maximizing monopolist does not deliberately withhold output from the market to drive up the price, no more than the profit-maximizing company in a perfectly competitive market. Nor does either seek to maximize price *per se*. Descriptions of pricing behavior in noncompetitive markets which seek to convey the impression that the firms in those markets deliberately set out to create artificial shortages or deliberately strive to maximize price, rather than profits, are grossly in error, both analytically and factually.[70] Such descriptions may be deemed by those providing them to be effective forensic ploys in an adversary proceeding, but they must be recognized as merely such.

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[67] Cf. Breyer and MacAvoy, op. cit.

[68] To recapitulate, if the price of new gas is set equal to average cost, then for every producer of gas subject to the regulated price, marginal revenue=regulated price=average cost. But even if the industry were perfectly competitive, there is no *a priori* basis for expecting that at this price the market will clear, since there is no reason to assume that marginal cost will be the same as average cost. In fact, the odds against the market's clearing are astronomical.

[69] Cf. Initial Brief of Congressman George E. Brown, Jr., Before the Federal Power Commission, in the Matters of Belco Petroleum Corporation Agent, *et al.*, Docket Nos. C173–293 *et al.*

In the erroneous view associated with the terms "market power" and "administered prices," the less competitive an industry, hence the greater the "market power" of the companies in the industry, the higher will be the prices of the products and services it produces and sells. This conclusion might follow if the typical firm in a competitive industry had exactly the same costs as the typical firm in a noncompetitive industry *and* if the *market* demands in their respective industries are identical.

Quite obviously, no such comparison can be made directly, since the conditions required for meaningful comparison are hardly likely to be met. Identical market demands are virtually inconceivable. The identical product cannot be sold at the same time in both a competitive and noncompetitive market which are otherwise identical. Nor, until the problem of comparing apples and oranges is solved, can any inference be drawn by comparing prices of differing products sold in markets of differing degrees of competitiveness.

Meaningful comparison, moreover, requires the assumption that there are no significant differences in costs as between the companies in perfectly and imperfectly competitive markets. If cost conditions do differ significantly, however, there is no basis for *a priori* judgment as to whether prices will be higher in imperfectly than in perfectly competitive markets. The validity of such judgment or finding would depend on knowledge of the cost conditions of the companies in the markets and a determination that the level of cost and the increase in costs with increases in output are closely and positively correlated with the degree of market imperfection. While it is conceivable that the degree of imperfection of competition exerts some influence on costs, far more important influences are the technical conditions of production and the basic conditions of supply of production inputs, and there is no reason to assume that these influences are significantly and systematically associated with the degree of competitiveness.

Indeed, an analytical answer to the question whether market prices are higher the less the degree of competition would require determination of what the market price of a product or service in fact sold in a competitive market would be if the market instead were noncompetitive (in terms of number of companies but otherwise identical). But this would be an unanswerable question since the degree of competition in a market is specifically related to actual economic factors.

b. When demand increases, do prices rise more in noncompetitive than in competitive markets?—In the popular but erroneous view, companies which are deemed to exert "market power" to "administer prices" allegedly increase prices more than competitive companies when demand increases and reduce prices less when demand declines.[71] Analytically, no such generalization is possible. Given the rules for profit maximization which apply equally to companies in competitive and noncompetitive industries, all that can be said is that the change in prices in either case will depend on the specific changes in the level and elasticity of demand for the respective products or services and upon the cost conditions of the companies.

For example, if one could assume that the cost conditions if the companies in both the competitive and noncompetitive industries were identical and that the initial market demand conditions were also identical, then if an increase in demand is associated with a decrease in elasticity of demand, prices will rise more in the noncompetitive than in the competitive industry. On the other hand, if the increase in demand is associated with an increase in the elasticity of demand, prices will rise more in the competitive than in the noncompetitive industry. If cost conditions change along with changes in demand, then it is also necessary to specify the changes in cost before a surmise about the comparative extent of price rise is possible.

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[70] Cf. Alchian and Allen, op. cit., pp. 308 ff.

[71] This misconception owes much of its popularity to Gardiner Means, whose monograph *Industrial Prices and Their Relative Inflexibility*, Senate Document 13, 74th Congress, 1st Session (January 17, 1935), sought to demonstrate that in concentrated industries, prices are changed infrequently and in particular are rigid downwards. Later work by Means attempted to show that the increase in the price level in the mid-50's was attributable to price increases by companies in concentrated industries which "administer" their prices. Cf. *Hearings before the Subcommittee on Anti-Trust and Monopoly of the Committee on the Judiciary, United States Senate, 1957*. For a critical examination of Means' views, cf. George J. Stigler and James K. Kindahl, *The Behavior of Industrial Prices*, National Bureau of Economic Research (New York, 1970), and George J. Stigler, *The Organization of Industry*, op. cit.

Merely characterizing the industry or market in terms of competitiveness is an analytically inadequate basis for generalizations as to the extent of price change in response to changes in demand. To repeat, the extent of price changes depends on the specific demand and cost conditions and changes therein. There is, moreover, no *a priori* reason to assume these demand and cost conditions are systematically associated with the degree of market competitiveness.

There have been several careful and objective empirical investigations of changes in prices in response to changes in demand conditions aimed at determining whether the extent of such price changes is correlated with the concentration of the industry, using concentration as a proxy index for competitiveness. The evidence from these studies is consistent with the above: no significant relationship exists between frequency or amplitude of price change and degree of concentration. A study by Richard Selden and Horace J. dePodwin comparing price with changes in concentration over the period 1953–59 shows that concentration explains only 1 percent between price movements and degree of concentration.[72] If one wishes to predict the proportionate change in price of the output of industry A vs. that of industry B, measures of the concentration of the industries will be useless for this purpose. The factual question as to the degree of concentration of any particular industry, e.g., natural gas, has no bearing on the extent of price change— where prices are free to change in response to changes in demand.[73]

Insofar as the argument against deregulation is based on objection to the possible gas price increases consequent thereto, one's belief concerning the competitiveness of the gas producing industry is not necessarily pertinent. It is certainly a fair surmise that under existing and likely prospective demand and cost conditions, the unregulated market price of gas would exceed the present FPC ceilings. But gas prices would rise as a result of deregulation irrespective of whether the market is effectively competitive or highly noncompetitive. And without far more information than is now available, pertaining to basic cost and demand conditions and the likely changes therein, no *a priori* assertion as to whether the price increase would be greater if the industry is deemed to be noncompetitive than if it is effectively competitive can be substantiated.

2. *Does the possibility of "windfall" profit, if the price of gas were deregulated, depend on whether the industry is monopolistic?*

The objection to "windfall" profits seems to be based on the idea that such profits are not earned, i.e., that they are realized not because of exceptional skill or industry on the part of those who realize them but because of events over which they exercised no control. It is, of course, the very nature of "windfalls"—whether profits or losses—that they are unanticipated, since if they had been correctly forecast the adjustments made by the market participants would have precluded their materializing. Thus, suppose that in an unregulated market, competitive or noncompetitive, one or more producers correctly forecasts that demand for the industry's products or services will expand by some given amount at some future time. The profit-maximizing rules discussed above would lead these producers to attempt to provide for a timely increase in their output, hence in their demands for production inputs. To the extent they succeeded in implementing thes plans, when the demand increase in fact materialized the market price would be lower and/or the costs of production higher than if the demand change had not been foreseen. The resulting profits, therefore, would be at a level determined by efficient, i.e., profit-maximizing, conduct of business. The profits would, of course, be those that had been incorporated into the companies' plans regarding investment, use of other production inputs, volume of production, etc. They would, in short, be the expected profits and, by definition, not "windfalls."

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[72] See their "Business Pricing Policies and Inflation," *Journal of Political Economy*, April 1963.

[73] Certainly one of the most careful and thorough studies of the prices of products produced by so-called "concentrated" industries is that by George J. Stigler and James K. Kindahl, op. cit. According to Stigler and Kindahl: "The main thrust of the doctrine of administered prices is that contractions in business lead to no systematic reduction of individual prices and . . . expansions in business may only tardily lead to price increases . . . Prices of concentrated industries . . . do not respond to reductions in demand, or so it is believed. We raise grave doubts of the validity of this belief . . . [O]ur collection of commodities is in no sense random; indeed it is purposely concentrated in the areas where "administered" prices are most often said to exist . . . [W]e find a predominant tendency of these prices to move in response to the movement of general business. As a summary figure, in the four cycles we find prices moving in the same direction as business 56 percent of the time; remaining constant 17 percent of the time; and moving perversely 27 percent of the time." Op. cit., pp. 7–9.

Windfall gains and losses occur because information is not complete or fully accurate.[74] But information is not costless, and the more nearly complete the information desired, the greater will be the cost of its acquisition.[75] Clearly then, information in any industry or market is likely to be far less than complete, particularly in a highly dynamic economy. "Windfalls," therefore, are are likely to be frequent and widespread. To impute something undesirable to "windfalls," whether gains or losses, is to wish for costless, perfect information as a universal tate of affairs.

To imply that "windfall" profits are realized only by "monopolists" suggests that only "monopolists" have imperfect foresight about cost and demand conditions or are consistently, even though unpredictably, lucky. This imperfection is strangely at odds with the popular notion that monopolists have "market power" which they exert to "administer" prices. Indeed, if the "market power—administered price" view were correct, monopolists presumably would have superior foresight and would realize windfall gains or losses far less frequently than others.

The fact of the matter is that windfalls are a well-nigh universal phenomenon in a dynamic economy in which economic entities have less than perfect foresight and knowledge. And far from being undesirable, they are an essential phenomenon in a market economy for achieving efficient allocation of resources.

As noted at the beginning of this discussion, one of the essential functions of a price is to provide information required for decisions about production. Profit may usefully be viewed as the price paid for the services of capital.[76] If the amount of capital to be used in any given line of production is to be efficiently determined, the price paid for the services of capital in alternative uses must reflect the real contribution to the value of output of those services in those alternatives. Unanticipated changes in profits—"windfalls"—are signals to affected producers to change the amount of capital committed to their production, relative to their original plans. If by some exercise of public authority these "windfalls" are concealed from producers, some other set of information from some agency other than the market must be provided. Experience here and abroad with governmental planning of economic activity and the allocation of production inputs affords no evidence of the superiority of this approach over the voluntary responses of free market participants to market-determined prices.

Of equal importance, windfalls must be clearly distinguished from the variations around the mean probability of the outcomes of business ventures. Virtually all investment decisions involve, either explicitly or implicitly, an estimate of a range of possible outcomes, from losses, i.e., failure to recoup the investment, to bonanzas, i.e., profits very substantially above those realized on the average. This variation in possible outcomes is the principal measure of the risk of a venture. The fact that one out of 10, say, ventures by a company results in extraordinary profits does not mean that the company has realized a windfall. On the contrary, if such extraordinary profits were not occasionally realized, then the average outcome of some large number of investments by the company would be lower, and the company's volume of investment over time, by the same token, would also be lower.

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[74] Or where, even with perfect information, sellers and buyers are prevented, say by public authority, from acting most efficiently upon the information.

[75] In addition, some information may simply be unavailable, e.g., the amount of rainfall on farms in different areas. Less rain than forecast may mean drought and windfall losses.

[76] In rigorous economic analysis, profit is regarded as that part of the price for capital services which exceeds the cost of production of these services. Since the flow of capital services is usually provided by a stock of capital of extended life, the price for capital services from any given stock of capital is likely to vary over the lifetime of the capital, in response to changes in demand conditions and in the cost of other production inputs used with the capital. To the extent that these changes are not accurately foreseen in the decisions to acquire the capital stock, hence are not included in the probability distribution of the net returns on that capital, the profits realized in any given time period may include windfall gains or losses.

Such variation in results occurs in every industry, and regulated industries are no exception. "A relatively small investment in exploration [for natural gas] can yield a very high return, or a large investment can yield a minimal return . . . However, the ex ante expectation of the profit from such investment on some risk-adjusted basis must be comparable to the expectations of competing investment projects or there will be a net flow of funds away from such activity . . . there must be movement away from commitment to drilling if average return falls." [77] By the same token, movement away from drilling clearly implies that average returns have fallen or are falling, even though one or more ventures yield above average returns. Since producers occasionally realize very high returns on gas sold subject to FPC regulation, regarding those high returns as "windfalls" would be to assert that regulation can no more than the unregulated market prevent the realization of "windfalls." The argument that regulation must be continued in order to prevent "windfalls", if they were defined as the extraordinarily high returns within the probability distribution of outcomes, then would be demonstrably wrong. And as we have shown, regulatory action cannot nor should it seek to prevent "windfalls", correctly defined, in the dynamic real world.

In the case of a product or service the price of which is set by public regulation rather than the market, the potential for "windfall" profits in the event of deregulation is always present, irrespective of the competitiveness of the regulated industry. As shown, such profits are essential if the investment required to eliminate the shortages caused by the regulatory authority's setting the price at an artificially low level is to be made.

Collateral with the argument that continued regulation of the price of gas is required to avert windfalls is the assertion that deregulation would result in a price that exceed the "just and reasonable" price for gas. Setting "just and reasonable" prices is one of the hallmarks of public utility regulation in the United States, despite the fact that "just and reasonable" is a term that defies precise economic meaning.[78] Over the years, however, the term has, apparently, come to mean a price at which the regulated company or industry will earn a normal rate of return on its equity capital.

As noted earlier in this discussion, normal rate of return is associated with market conditions of long-run equilibrium. If the FPC attempts to fix the price of gas so as to result in a normal rate of return in the gas producing industry, therefore, it must face precisely the difficulties discussed above in finding a market-clearing price equal to average cost of production. To repeat, these difficulties are insurmountable. In a word, no "just and reasonable" price for gas will clear the market unless the gas industry is in long-run equilibrium.

Given the present and prospective shortages, the industry clearly is not in long-run equilibrium. Deregulation would surely result in an increase in the price of gas, irrespective of the competitiveness of the industry. If FPC deems the present ceiling price to be "just and reasonable"—despite the fact that it has generated a severe shortage and continues to do so—then any market clearing price will exceed the "just and reasonable" price.

Moreover, "just and reasonable" prices cannot be construed as those which would prevail in competitive markets, except under conditions of long-run equilibrium. So long as market conditions of supply and demand are not those of long-run equilibrium, the unregulated market price will differ from the long-run equilibrium price at which only the normal rate of return is earned. And this proposition is just as valid if the industry is perfectly competitive as if it is highly noncompetitive.

Continued insistence on a regulted price for gas equal to the "just and reasonable" price based on at best grossly imprecise cost data, therefore, is the same as continued insistence on market disequilibrium.

Finally, the argument that continued regulation of the price of gas is necessary to protect the interests of consumers is equivalent to asserting that consumers are better served by artificially depressed prices and the resulting shortages than they would be by higher, market-clearing prices. Artificially lower prices and attendant shortages necessarily mean that some non-price, non-market mechanism must be used to allocate the quantity of gas supplied among would-be purchasers. Conceivably, some such non-price distribution method may be justified on political grounds; it cannot be justified on economic grounds. When the regulated price is below the market-clearing price, as at present. "Consumers who *do* get gas . . . pay less for it than it is worth to some nonconsumers who, because of regulation, are precluded from bidding it away. The level of total satisfaction to the nation is reduced by the difference between the production foregone in higher value uses and the production achieved in lower value ones."[79]

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[77] Clark A. Howkins, op. cit., p. 164.

[78] Cf. Alchian and Allen, op. cit., page 334: "There is nothing in economic analysis that permits any propositions about what is fair or not fair. In fact the words "fair", "just", or "reasonable" have no objective content . . . Except, possibly, one meaning—'The fair price is what I think it should be.' "

IV. CONCLUSION

Examination of the characteristics of the natural gas producer industry and of the data pertaining to its operations reveals that in every significant respect the industry is highly and effectively competitive. The contentions that the industry is noncompetitive rest on faulty analysis and misconceptions concerning competitive behavior and results as well as upon incorrect interpretations of the operational significance of some of the industry's practices. Under critical examination, those contentions fail both analytically and factually.

To argue that the industry is monopolistic and for that reason must continue to be regulated in its interstate operations in order to protect the interests of consumers is to urge the indefinite perpetuation of gas shortages. As shown, regulated prices based on arbitrary and imprecise computations of average production costs are not the prices which would prevail in an unregulated competitive market. Regulated prices do not serve the interests of consumers; rather, under present and foreseeable circumstances, they generate shortages which impair consumer well being. "In sum, at any given price more gas would be produced without regulation than with . . . not only because resources will be allocated more efficiently, but also because more resources will be committed to the industry."[80]

Appendix L

PERSONAL RÉSUMÉ OF NORMAN B. TRUE

I am Norman B. Ture, President of Norman B. Ture, Inc., an economics consulting firm in the District of Columbia. Norman B. Ture, Inc. provides research and consulting services to business, trade associations, and government with respect to a wide array of problems, particularly those concerning public policies.

I received the M.A. and Ph. D. degrees in Economics from the University of Chicago. I have held various academic positions at Illinois College, the University of Pennsylvania, and the George Washington University.

Before establishing my present consulting practice in 1971, I served as an economist with the Planning Research Corporation. Prior to joining PRC, I was Director of Tax Studies at the National Bureau of Economic Research, Inc., from 1961 to 1968. Earlier, I served as a member of the staff of the Joint Economic Committee (1955–1961) and on the Tax Analysis Staff, U.S. Treasury Department (1951–1955).

I was a member of President-Elect John F. Kennedy's Task Force on Tax Policy in 1960, Chairman of President-Elect Nixon's Task Force on Taxation in 1968, and a member of President Nixon's Task Force on Business Taxation in 1969–70. In addition, I have served on numerous other consulting and advisory groups to various Federal agencies.

Exhibit 2.—Additional Testimony of Dr. Norman B. Ture

NORMAN B. TURE, INC.,
ECONOMIC CONSULTANTS,
Washington, D.C., July 19, 1973.

Hon. PHILIP A. HART,
U.S. Senate,
Washington, D.C.

DEAR SENATOR HART: I enclose additional testimony submitted for the record of the June 26–28, 1973, hearings of the Subcommittee on Antitrust and Monopoly, Committee of the Judiciary, United States Senate. The additional testimony concerns (I) The Proposed National Energy Resources Corporation, (II) Comments on the Testimony by Dr. John W. Wilson, Chief, Division of Economic

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[79] Russell, op. cit., pp. 227–228.
[80] Russell, op. cit., p. 235.

Studies, Federal Power Commission, and (III) Comments on the Testimony by Dr. David S. Schwartz, Office of Economics, Federal Power Commission.

I hope that you and the Subcommittee Staff will feel free to call upon me in connection with any questions you may have concerning this additional testimony.

Sincerely yours,

NORMAN B. TURE.
President.

Enclosure

ADDITIONAL TESTIMONY SUBMITTED BY NORMAN B. TURE

My original testimony before the Subcommittee on Antitrust and Monopoly, Committee on the Judiciary, United States Senate, on June 27, 1973, focused primarily on Competition in Natural Gas Production. In the course of the Subcommittee's hearings, however, testimony was submitted by various witnesses on a large number of other issues. The following additional testimony, submitted for the record, concerns several of these issues.

I. The Proposed National Energy Resources Corporation

A proposal for a Federally-owned "National Energy Resources Corporation" (hereafter, NERC) to explore for, develop, and produce petroleum resources on publicly-owned land and offshore has been advanced on various occasions.[1] Various "advantages" are claimed for a NERC by its proponents. For one thing, so it is claimed, NERC ". . . could serve to supplement the privately-owned segment of the petroleum industry." [2] Presumably, NERC ". . . would be motivated to explore, develop, and rapidly commit new supplies because of its sensitivity to broader social needs." [3] NERC would also ". . . be sensitive to the environmental safeguards and conservation practices required in offshore operation." [4] In addition, a NERC's operation would not be guided solely by the profit-maximizing criterion of the private gas-producing industry: ". . . although it should manage the nation's resources in an efficient manner and on a profit-making basis, it would also be expected to be strongly motivated by the need to meet national energy requirements." [5] Moreover, NERC presumably would provide representative cost and other data pertaining to natural gas production, reserves, supplies, etc., to enhance FPC's price regulating ability. Finally, NERC would act as a "yardstick," exerting competitive pressure on private producers to increase supply and to restrain upward price pressures.

I. NERC AND EFFICIENCY IN NATURAL GAS PRODUCTION

The major issue raised by the NERC proposal is whether the existence and operations of any such government corporation would enhance or reduce the efficiency of natural gas and other petroleum fuels production.

In the private sector of the economy, the market place effectively and impersonally measures economic efficiency by the profitability of business undertakings. Moreover, differences in profitability serve the essential function of directing production inputs to their best uses. Blunting the profit-maximizing motive impairs the efficient, i.e., most productive, use of production inputs.

In a highly and effectively competitive industry such as natural gas production, profitability, i.e., efficiency, depends on minimizing costs. This is true for any gas producer, and it would be equally true for a NERC.

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[1] Most recently, by Mr. Lee C. White, Chairman of the Energy Policy Task Force of the Consumer Federation of America and formerly a Commissioner of the Federal Power Commission, by Congressman George E. Brown, Jr., and by FPC staff members John Wilson and David S. Schwartz, before the Antitrust and Monopoly Subcommittee of the Senate Judiciary Committee, on June 26, June 27, and June 28, 1973, respectively.

[2] White, op. cit.

[3] Schwartz, op. cit., p. 54. Schwartz's statement does not define "social needs," a phrase commonly employed in the public policy forum when the proponent of a new governmental activity is unable rigorously to define its purpose. Nor does Schwartz indicate what the undefined "social needs" are broader than.

[4] Ibid. The environmental safeguards and conservation practices required in offshore operation to which NERS would be sensitive are nowhere defined. Nor is there any indication in Schwartz's statement whether the environmental safeguards and conservation practices would be more or less restrictive of exploration, development, and rapid commitment of new supplies than those now observed by private producers.

[5] White, op. cit. "National energy requirements" are not defined or quantified.

The basic question raised by the NERC proposal is in what way would a NERC be more efficient than private gas producers? Would NERC produce at any given real total cost more gas than private producers? Would it produce any given amount of gas at a lower real total cost than private producers?

None of the NERC advocates have suggested any reasons to believe that NERC would be more efficient than private producers. On the contrary, NERC proponents have claimed as one of its advantages that its operations would not be guided solely by profit maximization but as well by "sensitivity to broader social needs."[6] By hypothesis, if the NERC's activities were not guided by efforts to maximize profits, it would be wasting the production resources at its disposal.

Disregarding the barrier to efficiency which would result from lack of a profit-maximizing criterian, what advantage would a NERC have over private producers in any of the various stages of the investment in additional gas reserves or in the production of gas? Would it have access to technical advances or to a superior technology not available to private producers? Would it have superior managerial and executive skills at its disposal? Would it be able to acquire drilling services at a lower real cost than private producers?

Neither theory nor past experience with government corporations suggest that a NERC would be as efficient as private producers. On the contrary, given the absence of incentives to efficiency, there would be a waste of resources and higher costs in general.

A dramatic example of the relative efficiency of a government corporation is the case of Australia's two interstate airlines. One is government-owned, one private. The government has excluded other firms from entry and has imposed a very high degree of uniformity on the two carriers, with respect to routes, stopovers, number and type of equipment, timetables, fares, and costs. The government carrier pays the same wages, sales and income taxes, insurance rates, and dividends (to the Treasury) that it would pay if it were privately-owned. Passenger service, food, and cabin configurations are virtually identical. The government operates all airports and assigns equal facilities to the two firms. It also divides its official passenger business between them equally.

Despite these similarities, the private carrier was more efficient on three counts for eleven consecutive years, up through the latest year available. The private firm averaged twice as many tons of freight and mail carried per employee, twenty percent more passengers per employee, and thirteen percent higher revenues per employee.[7]

Of course, doubts about the efficiency of government enterprises cannot rest on a single example. On the other hand, it is reasonable to require any proposal for new government activities and expenditures to meet rigorous tests of net gain to the nation. At the very least, NERC advocates should be required to demonstrate that over the years, the large number of government corporations have operated at least as efficiently, in real terms, as companies in the private sector of the economy.

II. NERC AND THE SUPPLY OF GAS

One of the principal arguments advanced for a NERC is that it would supplement private production of natural gas and petroleum liquids, i.e., increase the supply of these fuels. NERC advocates, however, are silent as to the many questions raised by this argument.

Private producers each year commit huge amounts of resources to geological and geophysical activity, to lease acquisition, to exploratory drilling, to development, and to production of petroleum products. Existing private producers could commit even larger amounts to these activities. The question is not whether it is physically possible to devote more of the economy's resources to these activities, but whether, and if so, to what extent, under existing and prospective circumstances it is in the interests of the economy as a whole to do so.

For example, suppose that under existing FPC price ceilings, each additional per MCF. By assumption, gas production could be increased by 10 percent, but to increase the amount of gas by, say, 10 percent over current production levels, it would require, on the average, an additional, say, 30¢ of production inputs per MCF. By assumption, gas production could be increased by 10 percent, but only at an addition to total cost per MCF which substantially exceeds the addition to FPC-permitted revenue per MCF. Clearly, this increase in production would be uneconomical, not merely for the gas producers but for the entire economy. Real production capability would be wastefully used, irrespective of whether the additional gas were produced by the existing private producers, by new private companies, or by NERC.

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[6] Schwartz, op. cit., p. 54.

[7] Cf. David G. Davies, "The Efficiency of Public versus Private Firms, The Case of Australia's Two Airlines," *Journal of Law and Economics*, Volume XIV, Number 1, April 1971, pp. 149–165. The data for the private carrier include some small intrastate subsidiaries, which may bias the results. It seems doubtful that these subsidiaries (all of which lose money and receive government subsidies) are more efficient than the competitive interstate carrier. To the extent that the subsidiaries are less efficient, the superior efficiency of the private operator demonstrated above is understated.

If the NERC were to undertake significant aditions to gas reserves and production without regard to costs or profits, its actions would in no sense be high-minded or sensitive responses to "broader social needs," unless the latter are to be defined as wasting scarce and valuable production services. Indeed, a NERC could serve the public interest only if its supply-increasing activities were guided by precisely the same efficiency-maximizing, i.e., profit-maximizing principles upon which private producers seek to operate.

Then, it may be fairly asked, how would NERC economically increase supply above that which private producers will make available? The answer by some of its advocates is that NERC ". . . by virtue of the fact that it would provide for an independent alternative source of supply . . ." would ". . . obligate producers to render services at prices reflecting just and reasonable rates." [8]

The argument rests on the premise that the gas production industry is non-competitive, that it is "combine" or a "stodgy cartel," [9] and that producers are conspiring to hold back on committing proved reserves and on gas production in order to force an increase in FPC ceilings on the wellhead price of gas. No substantively significant evidence pertaining either to the industry's structure or market results support this characterization and allegation. On the contrary, the industry has been shown to be highly and effectively competitive.[10] The risks which would be incurred by any one producer or group of producers in holding off on proving up new reserves or on holding back at any stage from initial investigation in seeking new fields to delivery of gas to a pipeline would be enormous. It passes belief that any producer would be willing to incur such risks.

The deliberate hold-back argument clearly implies that at existing FPC ceilings the producers allegedly holding back are not maximizing their current profits, (i.e., that at present levels of production, marginal costs are less than the FPC ceiling price [11] in anticipation of larger future profits by forcing an increase in the FPC ceiling. But before deciding to hold back, the producer must conclude with considerable certainty that doing so will result in a *large* price increase in the *near* future.[12] For the longer he must hold back on current sales, the larger his loss from foregone production becomes. Moreover, the present value of his increased future revenue diminishes as the increase is postponed, since a dollar of additional revenue to be earned in two years is worth less than a dollar to be earned in one year. Also, the longer he must wait for the price to rise, the larger the risk of increased production at current prices by other existing producers or by new entrants, hence the greater the risk of loss of market share. Clearly, if some producers were deliberately holding back, i.e., producing gas in quantities less than that at which marginal cost equals the FPC ceiling price, other firms, existing or new entrants, could enlarge their profits by committing additional reserves, unless it could be shown that in every case in which a producer is holding back, the producer's marginal cost for any given quantity of gas is lower than that of producers who are not holding back. Thus, producers who were deliberately holding back would have to be confident that they could prevent entry and preclude other producers from making additional commitments. If they could not, their holding back would result in expansion of future production by other producers, hence less of a future price increase. But the smaller the future price rise, the less worthwhile the risk and loss of current income.

If, contrary to fact, the industry were privately cartelized, any collusive effort by the cartelized companies to control output and price would require the cartel's control over all of the other gas producers, numbering in the thousands, *and* ability to bar entry of new producers. Since there are no inherent entry barriers, the only device which the colluding producers could use to control other companies and to bar entry would be to *maintain gas prices at a depressed level* at which profitability would be too low to attract additional capital to the industry. But to depress prices, the colluding producers would have to *increase* output. If the colluding producers, on the contrary, aimed at raising prices by decreasing their production, their success in this respect would result in expansion of sales by others, existing producers and new entrants.

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[8] Wilson, op. cit., p. 101.

[9] Ibid., p. 101.

[10] See Norman B. Ture, *Competition in Natural Gas Production*, Testimony Submitted to the Subcommittee on Antitrust and Monopoly, Committee on the Judiciary, United States Senate, June 27, 1973, pp. 5–44.

[11] If this is not the case, that is, if at present levels of output, marginal costs are equal to the FPC selling price, there is no speculative holding back involved; producers are supplying gas in such quantities as to maximize current profits.

[12] He must also find some way to conceal his holding back from holders of royalty interests or face highly punitive damage awards to them.

The collusion-to-hold-back-reserve-commitment-and-production argument is analytically senseless. Moreover, the data pertaining to the industry's operations afford no support for it. If producers were restricting output to force a price rise, one would expect to find production declining. Furthermore, the reserve/production ratio should be growing steadily, as producers prepare to take advantage of a price increase by boosting output from reserves rapidly when the increase is granted. But the table below shows that the opposite trends have actually occurred; production has risen and the reserve/production ratio has fallen each year for a decade.

ANNUAL ESTIMATES OF NATURAL GAS RESERVES AND PRODUCTION, 1962–72[1]

	Billion ft^3		Reserves/production (ratio)
	Reserves	Production	
Year:			
1962	272.3	13.6	20.0
1963	276.2	14.5	19.0
1964	281.3	15.3	18.3
1965	286.5	16.3	17.3
1966	289.3	17.5	16.5
1967	292.9	18.4	15.9
1968	287.3	19.4	14.9
1969	275.1	20.7	13.3
1970	290.7	22.0	13.2
1971	278.8	22.1	12.6
1972	266.1	22.5	11.8

[1] Figures include Alaska. 1972 Reserves/production ratio excluding Alaska was 10.5.

Source: American Gas Association, "Gas Facts," 1972, p. 11.

These statistics clearly indicate that the industry has expanded production rapidly, even at the cost of having lower reserves from which to supply future production.

Even if producers were withholding output, the usefulness of a NERC would depend on its being able to find and produce enough gas to make up the entire shortfall between the quantity privately supplied and the quantity demanded at the current price. Presumably, this shortfall must be very large, i.e., producers must have cut back output to a large extent; small reduction would hardly seem to warrant the expectation of a price rise sufficient to cover the risk involved in foregoing current profits. If NERC could not quickly fill the gap, producers would still have an incentive to hold back, since there would still be excess demand at the current price. But it is unlikely that NERC could add significantly to supply in the near term. In recent years, the largest producer has supplied 6–9 percent of all gas to interstate pipelines,[13] the market from which producers are allegedly holding back. If the quantity demanded at the current price exceeds the amount supplied by only 10 percent (implying a deliberate cutback of 10 percent or less by each producer), NERC would have to become the largest supplier in the market.

Finally, the notion that NERC could significantly increase the supply of gas entirely the impact of any large-scale operations of a NERC on the real costs of gas.

Gas exploration and development is extremely complex and difficult, requiring great technological sophistication, especially for offshore operations. No NERC would come into being with necessary skills and know-how. It would be required to hire existing firms and personnel and to acquire equipment.

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[13] Cf. FPC, *Sales by Producers of Natural Gas to Interstate Pipeline Companies* (annual).

The additional demand by NERC for these production services would certainly drive up their costs.

To cite a single example, the current rate of production of drilling rigs is lagging far behind the number of rigs now demanded for exploration of new leases, and the cost of rigs has risen sharply.[14] Significant increases in the demand for drilling facilities by NERC, unconstrained by requirements for profit-maximization, hence rigorous cost control, would further escalate the cost of drilling. With existing ceiling prices, such cost increase would inhibit exploration and development activity by private producers, irrespective of the competitiveness of the industry.

Since NERC demands for the production services required for the discovery and development of gas reserves and for the production of gas would increase the cost of these services across the board, marginal costs of production for all producers would be increased relative to what they otherwise would be. Increases in marginal costs are, by definition, *reductions* in supply. Thus, a NERC would reduce the amount of privately supplied gas, at any given price relative to the amount supplied in the absence of NERC. Unless, for reasons not even remotely suggested by its proponents, NERC were to be more efficient in real terms than private producers, it would at best merely transfer gas exploration, development, and production from private enterprises to the public sector (more likely, it would reduce the aggregate amount of gas supplied at any price, because it is almost certain to be a highly inefficient operation). Perhaps this socializing of the production of gas is the real objective of the NERC proposal. If indeed this is the case, policy-makers should be keenly aware of the real loss to the economy which in all probability would result.

III. NERC "REPRESENTATIVE COST DATA"

One of the advantages claimed for NERC is that it would supply the cost data, not satisfactorily obtained from private producers, which is required for regulation. As in the case of the other arguments for a NERC, even casual examination reveals that this one is substantively frail.

Unless NERC were trying to maximize its profits, it would not be producing at minimum cost, nor would it produce the most efficient quantity at a given price. Its cost experience thus would not be representative of private producers and could only misinform FPC.

One important aspect of efficient production is that it occurs over time. Producers do not produce all possible gas out of the ground instantaneously, nor do they keep current production as close to zero as they can. Rather they seek the most efficient pattern of production, revenues, and costs overtime. This requires an assessment of the present value of future income and costs. That is, each producer, just as any other businessman, must decide how much a dollar of future income or expense is worth today before he can maximize the value of his expected profits over time. This calculation depends on the discount rate, i.e., the rate at which he converts future income (or expenses) to present values. Such present value calculations are at the heart of the investment decision; the present value of the excess of revenue over costs with respect to a given investment must be at least as great as that which could be obtained from alternative uses of the resources committed to the investment if the investment is to be warranted.

For the government, however, there is no established discount rate and no market mechanism for setting one.[15] Clearly this will result in a different expenditure pattern and cost experience than for a private firm.

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[14] Cf. *Business Week*, June 23, 1973, p. 32: "One major problem could make exploration of the new leases difficult: the availability of drilling rigs . . . 'There is no way to take care of the overall rig demand on the short term basis . . . the shipyards are full, and the cost of these rigs is up tremendously.' "

[15] The scholarly literature reveals widely disparate views among economists as to the determination of an appropriate discount rate for the government to use. Cf. Robert Dorfman, ed., *Measuring Benefits of Government Investments*, (Washington, D.C. 1965); Otto Eckstein, "A Survey of the Theory of Public Expenditure" and Jack Hirshleifer, "Comments," in National Bureau of Economic Research, *Public Finance: Needs, Sources & Utilization* (Princeton, 1961); W. J. Baumol, "On the Social Rate of Discount," *American Economic Review*, Volume LVIII, Number 4, September 1968, pp. 788–802; Arnold C. Harberger, in *Economic Analysis of Public Investment Decisions: Interest Rate Policy & Discounting Analysis*, U.S. Congress, Joint Economic Committee, July 31, 1968.

One of the most important reasons that one cannot use the costs of a government enterprise to judge a private one is the difference in their funding. Private producers typically rely largely on their cash flow and to a lesser extent on attracting additional private investors. Because of the high risk involved in the industry, particularly in exploration, investors demand a higher return on investment in oil and gas than in many other lines. The cost of capital in the oil and gas industry, therefore, is relatively high. The amount of capital available to a gas producer may be severely limited, especially in the short run.

However, NERC would face apparently much lower capital costs. If it received funds through Congressional appropriations, it would treat its cost of capital as zero. If it borrowed from the Treasury or from private lenders with a Treasury guarantee against default or bankruptcy, it would pay much lower interest rates than private firms engaged in equally risky ventures which operate without guarantee of repayment.

Lease acquisition costs afford a clear example of the artificial capital cost advantage a NERC would enjoy. Lease acquisition costs are a major and increasing element of total investment by the industry.[16]

Moreover, there are no "typical" acquisition costs. Each property differs as to geological and geophysical characteristics, expected exploration and development costs, and expected income potential. Even if total expected costs and income from two tracts were comparable, the fraction attributable to gas alone would frequently differ. This is because oil is frequently found along with gas, in proportions which vary from one tract to the next. The amount that any firm is willing to pay for a tract, therefore, does not reflect its cost for acquiring a certain amount of gas. Yet it is this figure that an agency regulating only gas would want. Clearly, a NERC would no more be able to avoid this difficulty than private producers. Nor would it be able to avoid the problems involved in allocating the cost of dry holes. Its cost allocations would be as arbitrary and imprecise as those applicable to operations of private producers.

The most serious objection to the intervention of NERC in lease acquisition is the efficiency loss that would result. The economy's output is maximized by allocating production inputs to the producer who can use them with the least waste, that is, to the producers to whom the inputs are worth most. The only way to determine which producer values a given input most is to let every producer offer what he believes it is worth to him. That is exactly what happens in the case of lease auctions. If some sites were reserved for NERC or if it were able and willing, without profit-maximizing constraints, to outbid even the most efficient producers, then leases would no longer go to the producers to whom they are worth the most. The economy as a whole would lose.

Another problem in determining typical production costs stems from NERC's objectives. If it were not trying to maximize profits, its production costs would not measure representative costs of producers. Rather, its costs would be those of an inefficient, nonprofit-maximizing entity. And if NERC were to alter its production techniques to meet some social objective, lying beyond the perview of private producers, its cost experience would not be indicative of that of private producers.

Private producers pay various taxes and work under numerous regulatory restraints imposed by FPC and other federal and state agencies. It is unlikely that NERC would be subject to these costs. Yet if it were not, its cost experience would diverge in still another way from that of private producers.

NERC might very well devote more resources to attaining "social" goals than do private producers. Difficult as "social goals" are to define, it is even more difficult to quantify such goals and to measure the costs incurred in their pursuit.

One such goal might be to insure that the production of gas is "sensitive to the environmental safeguards and conservation practices required in offshore operation." [17] How much safer and how much more conserving should gas exploration, development, and production be than at present? What additional costs should be incurred for each increment—however measurable—of safety and conservation?

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[16] Most gas is produced on property that is leased by producers. *U.S. Energy Outlook* (National Petroleum Council, December 1972), p. 115, estimates 1971 expenditures of $817 million for lease acquisitions plus $140 million for lease rentals by oil and gas producers. The sum, $957 million, represents over 9 percent of the industry's expenditures for exploration, development, production, and overhead (excluding North Slope oil and all Alaska n gas). Under one projection, by 1985 lease costs will total $3.5 billion, or more than 16 percent of that year's expenditures. But these acquisition cost estimates may already be out of date. In the last two offshore lease sales, winning bids totaled $3.2 billion. Another sale is expected in December.

[17] Schwartz, op. cit., p. 54.

What would cast up the information NERC management would need to answer such questions?

Without the objective constraints of the market place, NERC costs would be indicative primarily of the preferences of NERC management. The guidelines relevant for a government enterprise which seeks to pursue nonbusiness objectives and goals of social policy are, by hypothesis, not appropriate goals for private enterprises without the authority or capability of government instrumentalities.

IV. NERC AS THE INDUSTRY "YARDSTICK"

One advantage claimed for the NERC is that its operation would act as an industry "yardstick," i.e., would exert pressure on private producers to increase supply and to restrain upward price pressures. Ostensibly, NERC would "* * * prompt commitment of available reserves and development of prospective reserves * * *" by private producers "* * * because of (their) awareness that the new corporation (i.e., the NERC) could accelerate its efforts and bring on independent supplies of gas."[18] Presumably, NERC could also cancel out any pressure from private producers on FPC to raise the ceiling price by bringing sufficient additional supplies of gas into any market with an actual or prospective shortage.

Clearly, NERC could have no significant impact as a yardstick unless the scale of its operations were quite substantial. Even if NERC were as large as the largest private producer, any realistic variation in the magnitude of its operations would be of little consequence for total supply and for pressure on the price of gas toward the market-clearing level. The yardstick argument implies a giant NERC, dwarfing the largest private producers. It implies, in other words, substantial socialization of gas exploration, development, and production.

Apart from this implication, it is not clear what guides a NERC would follow in pursuit of its yardstick function. If a NERC existed today, presumably it would be exploring, developing, and producing gas at 100 percent of capacity; moreover, it would, presumably, attempt to increase quickly the commitment of reserves to interstate pipelines and to augment rapidly the flow of gas at or below present FPC ceiling prices. But the technology of natural gas production precludes quick additions to reserves. And the incremental costs of increasing the volume of flowing gas in the short term would be extraordinarily high, far greater than existing FPC ceiling prices. By definition, any such action would be wasteful and inefficient.

Without committing substantial additional reserves, however, NERC would, in all likelihood, be ineffectual in offsetting present upward price pressures toward a market-clearing level. So long as the quantity of gas supplied, including that from NERC, is less than that demanded at existing ceiling prices, NERC's efforts to restrain price increases by reducing the price of gas it sells would simply intensify the shortage. Only by adding to the quantity supplied by private producers an amount of gas equal to the shortfall at the current ceiling price could NERC cancel the upward price pressure. But unless NERC could produce this additional quantity at a marginal cost significantly below that of private producers, its efforts to make up the shortfall would be highly wasteful in terms of the real resources that would be required.

The difficulties just outlined would be present under any circumstances, not merely those of the current gas shortage. So long as NERC departed from the profit-maximizing condition of producing that output the marginal cost of which is equal to its marginal revenue, any price-quantity decision it would make would be both arbitrary and inefficient. For example, if it were to base these decisions on average cost plus "fair" rate of return (the price-output decision which FPC staff erroneously identify as the competitive market solution[19]), it would only by purest chance come up with the most efficient output. Any other price-output determination would be equally arbitrary and equally likely to be inefficient.

Would a NERC attempt to make independent price decisions, i.e., act as if it really had the "market power" to "administer prices"? Or would it base its price-output policies on efforts to reinforce FPC ceiling prices? In the former case, assuming a NERC large enough to exert a significant influence on gas prices, the question might be fairly asked, "Why should FPC have any regulatory power over the field price of natural gas?" In the latter case, NERC would in effect be merely an instrument of FPC regulatory policy. As such, it would invest the FPC with an extraordinary capacity to control virtually every aspect of the natural gas industry, not in response to the dictates of the market, i.e., of consumer preferences and real production costs, but rather by reference to the preferences of the FPC and its bureaucratic technicians. It is difficult to visualize any circumstances in which the interests of consumers and economic efficiency would be more greatly imperiled.

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[18] Schwartz, op. cit., p. 55.

[19] Cf., e.g., Wilson, *Belco et al.,* Docket No. C173–293, et al., pp. 14–15.

II. Comments on the Testimony by Dr. John W. Wilson, Chief, Division of Economic Studies, Federal Power Commission before the Subcommittee on Antitrust and Monopoly, U.S. Senate Committee on the Judiciary on June 27, 1973

Dr. John W. Wilson attempts to show, in his testimony before this Subcommittee last month, that "* * * *the petroleum industry is not, in any economically meaningful sense of the word, either adequately or workably competitive* (p. 2, emphasis supplied). Much of his argument rests on irrelevant or misinterpreted evidence.

Wilson starts on the wrong track when he asserts "There is an absence of adequate competition when, as in the petroleum industry, sellers are able to exercise great discretion in establishing prices, supply levels, and other marketing strategies." In fact, as I indicate on p. 7 of my testimony, "Competition in Natural Gas Production", submitted to this Subcommittee on June 27, producers in any type of market "exercise discretion" in setting prices and quantities. But all producers, setting prices at the level which they hope will maximize profits, are constrained in doing so by the market demand for their products, over which they do not exercise control.

Wilson avows, quite properly, that "Concentration, after all, means virtually nothing in and of itself" (p. 4). He then proceeds to disregard this assertion, and devotes twenty pages, replete with largely irrelevant tables, to the topic. He asserts that "* * * concentration serves as a basis for logical conclusions derived via the classical deductive method of logic * * *" (p. 5), and attempts to substantiate this erroneous assertion by quoting completely nonanalytical, sociological observations by Corwin D. Edwards. Wilson should have stood by his original observation, for in fact measures of concentration are in no way indicative of degree of competitiveness.[20]

Wilson inserts in his discussion of concentration a Table 2 (p. 11) which purports to show the annualized first quarter 1972 and 1973 returns on equity of 26 major oil companies. Wilson fails to explain the pertinence of this information to his analysis, contenting himself with the assertion * * * "that the 'energy crisis' has not created obvious financial difficulties for these firms." (p. 10) The "average" return was only 12.6 percent in the first quarter of 1973.[21] No figures are presented to place this average in the context of other industries. But it is interesting to note that petroleum refining (which would include these integrated producers) was the only category out of the fifteen manufacturing groups surveyed by the Federal Trade Commission and Securities and Exchange Commission which experienced a decline in profits from 1971 to 1972.[22] Thus, a rise in early 1973 is even less surprising than it might otherwise appear. Furthermore, preliminary estimates by the Commerce Department's Bureau of Economic Analysis show that book profits before tax for all corporations rose from $88.2 billion in the first quarter of 1972 to $113.1 billion in 1973.[23] This is an increase of 28.2 percent, essentially equal to Wilson's "average" increase of 28.7 percent for the oil companies.

Moreover, as Wilson surely must be aware, annualizing a single quarter's results often provides grossly misleading impressions of developments in a company or industry. This is particularly true if the annualized quarter is compared with that of another year without adjustment for changes in overall business conditions.

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[20] See my prepared statement, *Competition in Natural Gas Production,* submitted to this Subcommittee on June 27, 1973, pp. 21–31.

[21] How this average or the sample of major companies were chosen is not clear. In fact, the median rate of return for the twenty-six was 11.5 percent.

[22] U.S. Department of Commerce, *Survey of Current Business,* May 1973, p. S–19.

[23] Ibid., p. S–2.

Furthermore, Wilson fails to point out the obvious fact that there is no rank correlation between company size and rate of return. If his Tables 1 and 2 demonstrate anything, it is that concentration measures have no bearing at all on operating results.

Wilson is wrong in claiming (p. 12) that: "A familiar rule of thumb is that in industries where the eight largest firms have at least 50 percent of the sales, normal unrestrained market forces are likely to be an insufficient guarantee against monopolistic market performance." There is no analytical basis for determining the number of firms necessary for effective competition. The size distribution of companies in an industry, which is all that concentration ratios measure, is not itself a determinant of the industry's competitiveness.

Table 3 of Wilson's testimony (p. 13) purports to show high concentration ratios for sales of new gas contract volumes sold to interstate pipelines in three areas. He excludes an unstated number of contracts involving more than one producer ("*et al.*" contracts). As he points out, "To the extent that the largest firms had either a disproportionately large share of the *et al.* volumes, or a disproportionately small share, the actual concentration ratios would be either slightly higher or lower." The latter conjecture is more probable, since *et al.* sales are likely to contain combines of small producers who would be less likely to produce singly. That is, the single-producer contracts are likely to be more heavily concentrated than all contracts.

Furthermore, the concentration ratio for a particular region does not give a true indication of the options facing a pipeline. Frequently the pipeline can buy gas directly from a producer in another region, or it can buy from another pipeline which draws on a different region.

Wilson attempts to paint an even darker picture by showing the concentration ratios for uncommitted reserves reported by 79 large producers on December 31, 1971, and June 30, 1972 (Table 4, p. 17). As he concedes in a footnote, "Nevertheless, to the extent that nonreporting small producers may have had significant volumes, the ratios reported here tend to slightly overstate actual market concentration." The omission is crucial. It involves 22 major producers, each of whom supplied more than 10 million MCF of gas in 1971, and over 3600 small producers.

The percentages in Table 4 are higher than in Table 3 and also less meaningful. No pipeline has to buy gas on a particular date. It can wait for the next offer of new gas. Furthermore, the eight largest reserve-holders in a region on one date are frequently not the same as the eight largest half a year later, or even a day later. Moreover, the company distributions of uncommitted reserves on a single day in many cases indicate nothing more than survivorship of successful exploration. Thus, if, say, 100 companies had acquired exploratory drilling rights in a given area and if 99 of the companies had come up with only dry holes, clearly the one successful company would have 100 percent of the reserves in that area. That is one reason the figures in Table 3, which takes the more realistic time span of a year, are lower than the one-day figures in Table 4.

Table 5 (p. 21), in which Wilson attempts to show the concentration of lease acquisitions, is grossly deceiving. He covers up the joint acquisition of many leases by lumping all bidding partners together with the "primary" firm. It is far from clear what source Wilson used for his estimates, but a look at the September 1972 sales shows that he apparently included under Gulf Oil's acquisition four tracts leased in combination with Mobil Oil and two Pennzoil affiliates,[24] two with Amoco Production Co., and three with Mobil and Chevron.

If these bidders are not incorrectly aggregated, it turns out that the four highest bidding groups included seven companies, and the eight highest included 11 companies in the September 1972 sale. In the December 1970 sale, the top four bids included 21 companies, and the top eight included 27 companies. In the December 1972 sale, the top bid was made by a combine of seven companies and the top ten bids included over 30 companies.[25]

Wilson lists petroleum industry mergers and acquisitions since 1949 in an effort to show that concentration is increasing. He claims that "the dominant majors (have) been free from the threat of new entry" (p. 22). However, as he implicitly recognizes, there has been considerable turnover within the ranks of the top suppliers,[26] and there has been extensive new entry, both by newly formed companies [27] and through acquisition of existing firms by firms outside the industry. In the latter category, he himself cites Monsanto Chemical, Allied Chemical, Diamond Alkali, and Swift & Co. (Table 6, pp. 23–25), all of which now rank as major interstate producers.

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[24] Pennzoil Offshore Gas Operators (POGO) and Pennzoil Louisiana and Texas Offshore (Plato).

[25] Cf. *The Oil and Gas Journal* for December 21, 1970, pp. 13 ff., regarding the December 1970 sale of leases in the Gulf of Mexico off Western Louisiana: *The Oil and Gas Journal* for September 18, 1972, pp. 38 ff., regarding the September 1972 sale; and *The Oil Daily* of December 21, 1972, pp. 1–2, for the December 1972 sale.

In short, Wilson's irrelevant and misleading information fails to establish that concentration is particularly high in the natural gas producing industry. Nor does he refute the more straightforward evidence that concentration is lower in natural gas than in a majority of manufacturing industries.[28] Most important of all, he is unable to show that concentration ratios are a reliable indicator of competitiveness. In fact, they are not.[29]

Wilson points to the numerous joint bids submitted in offshore lease sales as evidencing lack of competition. He goes so far as to maintain that "there is little or no substantive economic difference between and the end result obtained from the formation of a bidding combine and the end result of a conspiratorial agreement between oil companies to rotate bids" (p. 34). This preposterous claim ignores several obvious and well-known facets of joint bidding.[30]

First, there is vigorous competition for tracts. The lease sale of December 1970 drew 1043 bids on 127 tracts, and the 1972 sale drew more than 1000 bids for 219 tracts.[31] One block in 1970 attracted 18 bidders.

Second, it is not true on factual or theoretical grounds, as Wilson contends that the offshore leasing program "has become one of the most onerous anticompetitive cartelization devices at work in our domestic gas producing industry" (p. 34) because smaller producers "have been effectively precluded from entering these producing areas except by obtaining limited farmouts of unwanted acreage from the dominant majors or perhaps by joining one of the established companies as a junior partner" (p. 35). The winning bid out of the 18 for that tract in the 1970 sale, a record bid per acre up to that time, was not submitted by a combine of "giants," but by a group headed by a new entrant, Pennzoil Offshore Gas Operators (POGO), along with Mesa Petroleum, Texas Production and Mobil. "POGO and its partners had high bids totaling $153.3 million on 9 tracts.[32] The largest bids in that sale and in the December 1972 sale were submitted by a group which did not include any "giants": TransOcean Oil, Hamilton Brothers, Highland Resources, Hunt Oil, Kewanee, and Placid Oil (plus General Crude in 1970 and Ashland in 1972). At least 45 companies participated in the winning bids submitted in December 1972.[33] Far from removing competition, such combines enable companies which could not effectively bid alone to capture leases. In addition, the fact that major producers on occasion engage in joint bids with smaller ones convincingly demonstrates that the majors do not control the industry and are not trying to do so. If, contrary to fact, the industry were cartelized, then he majors would do everything possible to exclude competitors from bidding and production. Instead, joint bids by assorted combinations of majors and independents increase competition and reduce still further the chance of domination by any one firm or small group.

Third, companies which submit joint bids on some blocks compete on others, often during the same sale. Wilson himself documents (in Table 8, p . 31) that Chevron, for instance, bid alone 79 times in the 1970–1972 period and also participated in varying combinations with 9 other companies, some of which were competitors on other bids. In December 1972, Chevron teamed with Mobil, POGO, and Plato in the high bid on Block 532. It joined 6 other companies (some of which Wilson fails to list) in winning Block 249 over Mobil and a dozen other competitors.[34] Similar examples abound.

Furthermore, joint bidding does not mean joint marketing. On the contrary, joint ventures expressly provide for separate marketing of production.

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[26] Cf. Testimony of J. Rhoads Foster in Permian Basin Area Rate Proceeding, Docket No. AR70–1, p. 38, for a vivid graphical representation of this turnover.

[27] Cf. pp. 19–21 of my testimony of June 27, 1973.

[28] Cf. pp. 21–26 of my testimony.

[29] Cf. pp. 27–31 of my testimony.

[30] Cf. pp. 13–17 of my testimony.

[31] U.S. Department of the Interior, Geological Survey, *Outer Continental Shelf Statistics*, June 1973, p. 20.

[32] *Oil and Gas Journal*, December 21, 1970, p. 15.

[33] *The Oil Daily*, December 18, 1972, p. 12.

[34] Ibid., p. 12.

Wilson alludes to "a multiplicity of financial interlocks through which interstate pipelines have, in effect, provided hundreds of millions of dollars in interest free loans to natural gas producers in order to speed exploration and development" (p. 82).

There is nothing suspicious or covert about these advance payments, as the "loans" are correctly called. They have been explicitly and repeatedly authorized by the FPC. By providing producers with an additional source of capital, they have aided in the more rapid increase in production. From the standpoint of the pipelines, they are a means of guaranteeing more supplies to their customers. Far from restricting competition, they have made capital more accessible throughout the industry.

Wilson asserts that "market control in the petroleum industry, including the natural gas producing sector, is held by a closely knit consortium comprised of the large, fully integrated oil companies and their jointly interlocked affiliates. These firms, working in cooperation with each other, have the ability to control petroleum supplies and, in so doing, to maneuver for monopolistic market price levels" (p. 83).

In making such a fantastic claim, Wilson is evidently unaware of his Commission's own statistics. These show that in 1971, there were 101 major producers, each supplying at least 10 million MCF of gas per year to interstate pipelines, an estimated 3,644 small producers,[35] plus an unknown number of producers selling intrastate only. The vast majority of these producers were independents, not "large, fully integrated oil companies" or "their jointly interlocked affiliates."

Furthermore, no company or "closely knit consortium" can control price. As Wilson himself points out, "virtually all of the largest interstate natural gas pipeline companies are also involved in petroleum exploration and development—either directly or through corporate affiliates." (p. 79). This fact alone helps keep prices down. Producers recognizes that the pipelines are not beholden to them but can turn to their own affiliates for gas if the price is not sufficiently low.

Clearly, a pipeline will integrate vertically only if it realizes some cost saving by itself engaging in production. It is well established in economic theory that a vertically integrated producer will maximize profits by setting price equal to marginal cost for every intra-company transaction, just as any competitive profit-maximizing, non-integrated firm will do.[36] There is no basis for assuming that vertical integration of one or more companies in the industry will cause natural gas prices to be any higher than otherwise.

The same observation applies to the intrastate market. Wilson apparently believes that producers in intrastate commerce are uninterested in profit maximization; "e.g., Producer X buys gas in the intrastate market from another producer, Y, at a high price (perhaps X uses this gas as fuel in his refinery)" (p. 85). Yet if X is interested in maximizing profits he will purchase fuel (and every other input) for his refinery at the lowest possible price. If he pays a "high" price, presumably the fuel is not available for a "low" price. Moreover, even if X is a subsidiary of Y, the price paid by X will not exceed Y's marginal cost for the gas if Y is to maximize its overall (i.e., X and Y) profits.

Moreover, evidence from the FPC shows very close congruence of intrastate and interstate prices. Table 2 of my testimony (p. 41a) presents a comparison using data from FPC Docket No. R–389A for intrastate sales, of prices on new gas sold interstate and intrastate over the years 1966–1969 in four different areas. The conclusion is unmistakeable: both the weighted average and the range of prices are very close in the two markets (indeed, the *intrastate* price is frequently lower). This is exactly what one would expect from a competitive industry.[37]

Wilson proposes the establishment of a government corporation to develop petroleum energy resources on Federal property (pp. 89, 101–103). Wilson errs in forecasting that such a corporation would spur producers into greater activity.

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[35] Federal Power Commission, *Sales by Producers of Natural Gas to Interstate Pipeline Companies,* 1971, p. vi.

[36] The problem of the correct inside pricing—or transfer pricing—of intermediate products produced in a vertically integrated firm is discussed in Kenneth J. Arrow, "Optimization, Decentralization, and Internal Pricing in Business Firms," *Contributions to Scientific Research in Management Science*, McGraw Hill Book Company (New York) 1964, pp. 9–18; Jack Hirshleifer, "On the Economics of Transfer Pricing," *Journal of Business of the University of Chicago,* Vol. XXIX, No. 3, July 1956, pp. 172–184; Hirshleifer, "Economics of the Divisionalized Firm," *Journal of Business of the University of Chicago,* Vol. XXX, No. 2, April 1957, pp. 96–108; Mohamed Onsi, "A Transfer Pricing System Based on Opportunity Cost." *The Accounting Review,* July 1970, pp. 535–543.

[37] Cf. pp. 33–42 of my testimony.

In fact, the additional demand that it would create for already scarce geophysical and geological knowhow, drilling rigs, and other specialized manpower and equipment, would make development and production of natural gas even more costly and less attractive for private producers. Rather than acting to "establish a force which will obligate producers to render service at prices reflecting just and reasonable rates" (p. 101), a government corporation would only discourage private production.

Wilson concludes that one necessary reform is "the establishment of a clear understanding that just and reasonable prices should fairly reflect no more than the costs of efficient operations plus a reasonable rate of return" (p. 105). It is impossible for a regulatory agency to set "just and reasonable" prices,[38] and virtually as difficult for it to set prices that will clear the market and effectively allocate output.

Wilson's testimony is almost entirely irrelevant and misleading concerning the competitiveness of natural gas production. Nowhere does he show that the industry is noncompetitive, although he relies heavily on "indirect evidence" which is analytically without foundation. Nor does he demonstrate how increased regulation will solve the current gas shortage, a shortage which has been created by regulation.[39]

III. Comments on the Testimony by Dr. David S. Schwartz, Office of Economics, Federal Power Commission before the Subcommittee on Antitrust and Monopoly, U.S. Senate Committee on the Judiciary on June 27, 1973

Dr. David S. Schwartz asserts in his testimony before this Subcommittee that "This industry can best be characterized as a vertically integrated bilateral oligopoly, that is, a market with major imperfections in both buying and selling." (p. 8). This characterization is certainly unwarranted with respect to gas producers-sellers. (Cf. my testimony to this Subcommittee on June 27). In addition, FPC data show that there were 103 interstate pipeline companies in 1971, accounting for an estimated 70 percent of new gas purchased in that year.[40] Another 7 billion MCF was sold to an indeterminate number of customers. No formal basis exists for determining the minimum number of firms at which an industry is oligopolized, but it is certainly a distortion to characterize an industry with several thousand sellers and hundreds, if not thousands, of buyers as oligopolistic.

Schwartz asserts: "In a workably competitive market, it is the costs (plus a fair rate of return) associated with bringing the product to the market that determines the price anticipations of producers" (p. 5). This is incorrect. Price anticipations of producers-sellers depend on a variety of factors, including in the case of the natural gas industry the general cast of price regulation, as revealed in part by past ceiling prices and the changes therein in response to changing cost constraints on exploration, development, and production. Schwartz probably intended to characterize the conditions of supply, i.e., the amounts producers are willing to invest in the discovery and development of new reserves and the costs they must incur in the production of additional quantities of gas. Schwartz repeats the demonstrably wrong FPC staff contention that the amount of gas supplied depends on its average cost including a fair rate of return.[41] It is, however, the marginal cost, not the average cost that determines the quantity supplied. "Any assertion that the cost of gas is the competitive market price is simply, unmistakeably wrong. It is wrong in the context of the rudimentary theory of competitive price. And it is wrong as a characterization of the real world state of affairs. And it is wrong irrespective of one's belief as to the competitiveness of the gas producing industry.[42]

Schwartz contends: "The primary objective of regulation is to determine a price which will cover the resource cost of bringing energy to market . . ." (p. 6). This is not always cited as the first goal of regulation, and it is certainly a goal that the FPC has not attained.

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[38] Cf. pp. 70–71 of my testimony.

[39] Cf. pp. 54–57 of my testimony; also Stephen Breyer and Paul W. MacAvoy, "The Natural Gas Shortage and the Regulation of Natural Gas Producers," *Harvard Law Review*, April 1973, pp. 941–987.

[40] FPC, op. cit., p. v.

[41] The cost concept employed by Schwartz is an artificial, public utility notion of "cost of service." This cost concept has little in common with the real economic costs of any commodity or service, including gas, which are clearly delineated in elementary economics textbooks.

[42] P. 53 of my testimony. Cf. pp. 47–53 of that testimony for an extended discussion of Schwartz's error.

"It must surely be evident that FPC has seriously underestimated both the increase in demand and the increase in costs of gas production. As noted earlier, the industry is appropriately characterized as one of increasing costs. Efforts to increase gas supply by the addition of reserves result in sharply rising average costs. Taken together with the rapidly accelerating increases in the demand for gas, these factors have called for substantial increases in gas prices if shortages were to be averted. FPC ceiling prices, no matter how determined, have fallen far short of those required to clear the market.

"Both abstract and empirical analyses leave no room for doubt that since gas prices were established by the FPC at the level of gas costs, regulation must be blamed for the gas shortage that has developed. Moreover, regulation *per se* is responsible for the shortage, entirely irrespective of the degree of competitiveness of the regulated industry.

". . . if the price of new gas is set equal to average cost, then for every producer of gas subject to the regulated price, marginal revenue-regulated price-average cost. But even if the industry were perfectly competitive, there is no *a priori* basis for expecting that at this price the market will clear, since there is no reason to assume that marginal cost will be the same as average cost. In fact, the odds against the market's clearing are astronomical.[43]

Despite the inability of the FPC to regulate supply effectively, Schwartz feels the agency should be given power over demand as well: "If supplies are inadequate, in the short run, we should rely upon direct controls such as the end-use priorities set by the FPC in its curtailment procedures. It is inconceivable that we should permit the private interests to perform the role of tax collectors and to assign priorities in the market place by imposing a price increment above that which would prevail under workable competition" (p. 7).

Priorities in the market place are never set single-handedly by suppliers. They are determined by buyers deciding how much of any commodity they want in terms of its utility to them. Such allocations are far more socially efficient, equitable, and democratic than any cumbersome bureaucratic procedure.

Moreover, there is no issue concerning ". . . imposing a price increment above that which would prevail under workable competition." FPC price *ceilings* are not floors. FPC has no power to *impose* a price increment above that which clears the market. Indeed, the principal requisite for such power is precisely that which Schwartz proposes be given to FPC, i.e., the direct controls over which consumers are to get how much, if any, gas. Such authority is appropriate to a totalitarian state; it is grossly at odds with the requirements of a free society. The proposal to elaborate FPC control over end use reflects the empire-building aspirations of the bureaucrat who "knows" that he knows what the people should have and at what price.

Schwartz interprets the plea of a pipeline group for deregulation as evidence "that very little motivation exists for pipelines to drive a hard bargain and that the relative strength of producers acting in combination is decidedly enhanced" (p. 16). It is difficult to understand why he fails to cite the obvious explanation for pipeline companies' wishing to see deregulation, viz., FPC regulation has resulted in a gas shortage, hence in constraints on the growth of their sales; deregulation will result in expansion of gas supply, hence allow pipeline sales to increase in line with market forces. By the same token, deregulation will strengthen the bargaining position of interstate pipelines. It will encourage exploration and development whch will increase supply.

Schwartz errs along with Wilson in maintaining "that small sellers are unable to enter prolific offshore areas independently or at all because of significant large investment requirements" (p. 19). His assertion is factually incorrect.

Schwartz points to "over fifty major mergers during the 1960's alone" (p. 21) as a sign that competition is inadequate. Like Wilson, he is relying on inaccurate and irrelevant information. Mergers provide no indication of the degree of competitiveness of an industry, particularly when new firms are constantly starting up. As George J. Stigler put it: "A comprehensive census of mergers would reveal a vast number that have no real relevance to the question of monopoly.[44]

Moreover, Schwartz's list of "over fifty major mergers" actually numbers only fifty even, and at that includes such "major" mergers as the acquisition of Tekoil Corp. (assets $12.4 million) by Consolidated Oil and Gas (assets $4.9 million).[45]

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[43] P. 57 of my testimony. Cf. pp. 54–57 for further discussion.

[44] George J. Stigler, *The Theory of Price,* 3rd ed., The Macmillan Company (New York, 1966), p. 236.

[45] Cf. Table 6, p. 24, of Wilson's testimony.

Schwartz suggests that "if we assumed an annual growth rate of 1.4% our potentially recoverable gas reserves would be adequate for 32 years using the Potential Gas Committee forecast or for 65 years using the U.S. Geological Survey estimates"[46] (p. 23). The assumption of an annual growth rate of 1.4 percent is scarcely realistic. According to the U.S. Bureau of Mines, production has risen by 5.2 percent a year over the past decade (1962–72). If that growth rate continues, potentially recoverable reserves will be exhausted in 25 years, using the Potential Gas Committee estimate, or 35 years, using the Geological Survey estimate. Such prospects hardly validate Schwartz' sanguine assessment that "there is no question that * * * there is no physical shortage of potential natural gas supply" (pp. 22–23).

Schwartz asserts that "the imperfections in fuel markets generally make it possible for an increase in the price of gas to trigger an increase in the price of other fuels, particularly when these firms market petroleum products as well as coal" (p. 26). He does not substantiate this claim, which is analytically unsound. The fact that a shortage of gas exists at the current price necessarily implies that some users of other fuels would buy gas instead if it were available. If the price of gas rises, supplies will increase and would-be customers who are now using alternatives will be able to buy gas. Their demand for other fuels will fall, creating downward, not upward, pressure on the price of alternatives. The fact that some gas producers also sell alternative fuels is totally immaterial to this analysis.

Schwartz presents data on the decline in well drilling over the past decade (p. 26 and Table I). He notes that the decline has been greater for developmental than for exploratory drilling and reaches the illogical conclusion "that the industry continued to explore for new gas supplies but deemphasized development and potential commitment of new supplies to meet market demands" (pp. 26–27). As usual, he fails to provide either a factual or an analytical basis for this claim. The logical conclusion, of course, is that gas is becoming harder to find and that development of many reserves is not profitable at current prices. Surely Schwartz is familiar with the straightforward evidence for this conclusion: both the percentage of dry holes and the average well depth have increased year by year.[47] Since drilling costs increase more than proportionately with well depth, drilling has become steadily more expensive.

Schwartz observes that "A comparison of the average five-year earlier period [i.e., 1963–67] with the 1968–1972 five-year average indicates net production going up by more than 29%, total reserve *additions* going down by approximately 50% in response to a 33.5% increase in weighted average initial contract prices and 13.8% [increase in] weighted average new gas ceiling prices" (p. 28) (underscoring added). The fact cited by Schwartz that net production increased by more than 29% in the period 1968–1872 is certainly at odds with his assertion that producers are deliberately holding back on gas production to force an increase in the FPC price ceiling.

In the same context, Schwartz professes to be puzzled by what he identifies as ". . . an inverse relationship between price and new supplies—what economists would call negative elasticity" (p. 28). In fact, Schwartz need not be puzzled if he will only refer to elementary economic principles. A short-run supply schedule denotes the alternative quantities a company or an industry operating to maximize profits, will produce and offer for sale at alternative prices for the product, *given the techniques of production and the costs of the production inputs.* If either or both of these change, a new supply of the production results. For example, with given production technology and prices of production inputs, a company (or an industry) might produce, say, 1,000 units of its product if the price were, say, $1.00, 1,010 units if the price were $1.05, 1,020 units if the price were $1.10 etc. Suppose that both the technical conditions of production and the costs of production inputs change, and under these changed circumstances, the company (or industry) would produce only 900 units if the price were $1.10, 903 units if the price were $1.05, and 905 units if the price were $1.10. Suppose that before these changes in cost conditions the price was $1.00, and after the changes the price is $1.10. By assumption, the quantity supplied initially was 1,000 units, and subsequently it is only 905 units. Clearly one should not disregard all of the changes in the technical and cost constraints on production and conclude that the higher the price the less the quantity supplied, yet this is precisely what Schwartz does.

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[46] Schwartz' arithmetic is faulty. The correct durations under his assumptions are 38 and 60 years, not 32 and 65.

[47] American Gas Association, *Gas Facts, 1971,* p. 43: National Petroleum Council, *U.S. Energy Outlook* (December 1972), p. 85.

It is well known that the petroleum industry is an increasing cost industry. Schwartz has taken price-quantity observations from *different* supply conditions and erroneously referred therefrom a negative elasticity of supply.

According to Schwartz (Table II), the weighted average initial contract price increased from 17.0¢ per MCF in 1963 to 25.8¢ per MCF in 1971, or by 51.8 percent. The average drilling expenditure per gas well (excluding lease acquisition, exploration, development and production costs and expenditures for service wells) rose from $92,368 in 1963 to $166,582 in 1971, or by 80.3 percent.[48] Lease acquisition costs have also risen much more rapidly than prices. The following Table (from U. S. Geological Survey, op. cit., p. 20) shows that the average winning bid price per acre for offshore Louisiana tracts rose by 1213 percent from 1962 through 1972.

March 1962	$236.78
June 1967	685.17
December 1970	1,548.10
September 1972	2,017.86
December 1972	3,108.04

In light of the steeper increase in costs than in prices, it is not at all "puzzling," as Schwartz believes (p. 28), that additions to reserves have fallen in recent years despite modest price increases.

Schwartz asserts that there has been a high percentage of "shut-in" wells federal offshore leases in recent years (Table IV and pp. 30–31), and concludes that "there have been and are anticipations on the part of producers which have led to significant postponement of commitment from the offshore area" (p. 31). Instead of leaping to the conclusion that thousands of gas producers have joined in a successfully enforced conspiracy to cap their wells and postpone commitments (a completely implausible notion), Schwartz should have informed the Subcommittee that all but a small number of these shut-in wells are already committed to existing gas purchase contracts. Of those that are not, moreover, only a handful represent gas reserves which could economically be made available to the interstate market. Shut-in wells represent a very small amount of uncommitted reserves.

Schwartz is correct in saying, "It is the incremental cost of bringing forth new supplies of gas that is relevant for the firm in an operational context" (p. 32).[49] But he follows this observation with one that is utterly false: "This is the motivating factor behind the regulatory determination of a new gas price equating incremental costs plus fair rate of return which would conform to the concept of an equilibrium price in a competitive market" (p. 32). In the first place, "incremental cost plus fair rate of return" would *not* "conform to the concept of an equilibrium price in a competitive market" except if (a) the industry were in long-run equilibrium and (b) is operating subject to constant costs. The first condition demonstrably and evidently does not exist, and Schwartz surely knows that the industry is characterized by conditions of increasing long-run costs, not constant costs. Secondly, what Schwartz labels "incremental cost", which he alleges FPC uses for its price regulation determinations, is, in fact the *average* cost of a larger output, not the increase in total cost associated with that larger output. The latter, in fact, is the incremental or marginal cost that is "relevant for the firm in an operational context." Schwartz's assertions are completely at odds with even rudimentary price theory.

Schwartz' confusion and the absurdity of his observation are nowhere more evident than in his discussion of supply elasticities (pp. 32–35 and Table V). In this discussion, by unqualifiedly equating the marginal cost of gas production with the cost to consumers, he contends that "the consumer would be better off if the price were kept at 25¢ per MCF instead of 37.5¢ and supplements or alternative fuels were purchased to satisfy the incremental need of one-half TCF as long as they could be obtained for something less than the equivalent of $2.87 per MCF" (p. 33).

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[48] Cf. FPC. *Statistical Data Associated with Exploratory Effort and Discovery of Gas Reserves, United States*, Docket No. R389–B, p. 54.

[49] This statement by Schwartz, incidentally, is at odds with his assertion on page 5 of his testimony.

One of the substitutes which buyers are turning to is liquefied natural gas (LNG), selling at prices far higher than 37.5¢ MCF. Since regasified LNG is indistinguishable from natural gas, it is inconceivable that users would prefer to pay many times the natural gas price for LNG if other supplies were available. Yet this is exactly what Schwartz contends in saying that "the consumer would be better off it supplements or alternative fuels were purchased as long as they could be obtained for something less than the equivalent of $2.87 per MCF."

Actually the relevant price for the consumer is 37.5¢, not $2.87. The consumer who faces a choice of buying gas at 37.5¢ per MCF, or doing without any and buying a higher-priced fuel instead if the price of gas is held down arbitrarily, is not likely to feel he "would be better off if the price were kept at 25¢ per MCF." It should be remembered that price will rise to 37.5¢ (for example) only if demand exists for gas at that price. The assumption that 10.5 TCF would be sold at that price is proof enough that consumers would feel better off with gas at 37.5¢ than without it at 25¢.

Furthermore, Schwartz uses illustrative elasticities which may be unrealistically low. As he points out, there is "uncertainty regarding the supply-price elasticity in the long run" (p. 33). Yet the highest elasticity he chooses is .5 (out of a range of zero to infinity). The higher the elasticity, the lower the cost of raising supply. In the long run, the supply is generally considered quite elastic, as firms are able to expand output, new firms can enter the industry, etc. With an elasticity of 2, for example, the marginal cost that Schwartz calculates to be associated with a prise rise from 25¢ to 37.5¢ per MCF is only 50¢ per MCF.

Part of Schwartz' error is in assuming that elasticity of supply remains constant over the entire price range from 25¢ to 50¢ per MCF. In fact, Schwartz' assumption of constant elasticity would lead the FPC to conclude it should roll back the ceiling price to, say, 1¢ per MCF. Assuming a constant elasticity of supply of .1, this 96 percent decrease in price (from 25¢ per MCF) would induce suppliers to cut production by only 9.6 percent to 9.04 billion MCF (9.04 TCF), an obviously absurd result. Under Schwartz' line of "reasoning", consumers would pay a total of only $90.4 million (=1¢×9.04 TCF) instead of $2.5 billion, a saving of $2.4 billion.

Why does Schwartz arrive at such absurd conclusions? As previously shown, his assumptions about elasticity of supply are extremely unrealistic. Moreover, he assumes that demand and supply are no win equilibrium, an assumption which is patently false and which he himself abandons in hypothesizing an increase in price. This invalidates his results, for it fails to account for the change in demand for substitutes. If more gas is consumed at 37.5¢ per MCF than at 25¢, as Schwartz assumes it would be, some consumers must be currently paying more than 37.5¢ for a substitute. They will therefore realize a saving. Furthermore, the assumed increase in the consumption of gas necessarily would mean than the demand for substitutes will diminish, pushing down the price of the substitutes. Thus, all buyers of the substitutes will also save.

Moreover, in stating that consumers would be better off buying additional substitute fuels equivalent to one-half TCF of gas at any price less than $2.87 per MCF, Schwartz implicity assumes that the elasticity of supply of the substitute fuels is infinity, i.e., any additional quantity of such fuels will be supplied at an unchanged cost. While purporting to show the increase in social costs for an addtional one-half TCF of gas, he neglects to present corresponding estimates for an equivalent increase in other fuels. Since these substitutes currently cost considerably more than natural gas, there is a strong likelihood that their incremental social costs will substantially exceed the costs that Schwartz presents for additional natural gas.

Finally, Schwartz's recommendation that the price of gas should not be increased, necessarily implying, on his own assumptions, that the quantity of gas should not be increased, is ludicrously at odds with the theme of his entire testimony, viz., that the Nation should have a greater supply of gas and would have it but for the conspiracy of gas producers to hold back production. Unless he believes that, by some sort of magic, additional gas can be produced at no incremental social cost of the magnitude he himself suggests he has impaled himself on the horns of his own dilemma : On the one hand, additional gas should be produced and the conspiring producers should be forced to increase supply, but on the other hand, additional gas should not be produced because the social cost of the additional supply would exceed that of alternative energy sources.

Schwartz continues to muddy the waters with his estimates of the overall impact on consumers of increased gas prices (Table VI and pp. 35–37). He compares the price of expiring contracts with various new gas prices, but he makes no allowance for the fact that exploration and development costs have risen tremendously since the expiring contracts were written. In short, it would be impossible to replace the volumes covered by expiring contracts at the old rates. Therefore, the only relevant comparison is between the price necessary to bring forth sufficient new gas and the cost of alternative fuels which consumers would have to buy if the additional gas is not available.

In a characteristically irrelevant aside, Schwartz concludes that "a significant proportion of the total volumes under contract expiring in 1973–1980 can be attributed to the top five producers" (p. 37). But the five differ from year to year and region to region. There are actually from 14 to 21 producers among the top five in each region over the eight year span, according to his Table VII. Furthermore, it is not clear if the "total volumes" actually refer to all production in an area or only to production by major producers or only to sales to interstate pipelines. In brief, the figures are meaningless and deceptive.

Schwartz echoes Wilson's erroneous contention that "the ability of the pipelines to withstand producer demands for higher prices is significantly vitiated because of their self-interest as producers of gas" (p. 40). As stated earlier, vertical integration does not lead to sacrificing the profits of the total business to increase the profits of a part of it, and the existence of production subsidiaries gives to pipelines a means of resisting price increases by their other suppliers.

Schwartz also shares Wilson's confusion about joint ventures being "anticompetitive." This is completely inaccurate, as I showed above and in my testimony.

Schwartz avers that "the only way in which social priorities can be implemented on a uniform basis is to regulate both intra and interstate sales of natural gas" (p. 50). Nowhere does he define "social priorities," or demonstrate how these undefined "social priorities" would be implemented by extending FPC control to the intrastate market. Nor does he deal at all with the social loss from the inefficient nonmarket allocation of supplies, or with the impairment of consumer wellbeing resulting from curtailments.

He is also wrong in asserting, "There is no doubt that the intrastate market can always offer a little more than any ceiling price set by the FPC * * *" (p. 50). That is true only so long as the FPC sets the price so low that the quantity demanded exceeds the quantity supplied. If the FPC set a ceiling at or above the market-clearing price, the interstate and intrastate prices would coincide.

The rise in intrastate prices is not responsible for the pressure on interstate prices, as Schwartz believes; it is symptomatic of a shortage of gas which can be remedied only by freeing all gas prices to clear the market.

Exhibit 3.—"Comments on Certain Matters Raised During Hearing on Natural Gas—June 26, 27, 28, 1973," by W. O. Senter, Executive Vice President, Gas Supply Committee

Gas Supply Committee,
Washington, D.C., July 16, 1973.

Hon. Philip A. Hart,
U.S. Senate,
Washington, D.C.

Dear Senator Hart: I enclose a part entitled "Comments on Certain Matters Raised During Hearings on Natural Gas—June 26, 27, 28, 1973." This paper provides some additional information on matters which arose during the hearings and which should be considered in reaching any conclusions based on such hearings.

Additional testimony will be submitted by Dr. Norman B. Ture on economic matters by July 20, 1973.

If these materials raise any further questions, please call upon me.

Sincerely,

W. O. Senter,
Executive Vice President.

Enclosure.

COMMENTS ON CERTAIN MATTERS RAISED DURING HEARINGS ON NATURAL GAS JUNE 26, 27, AND 28, 1973

The Subcommittee on Antitrust and Monopoly of the Committee on the Judiciary of the United States Senate held hearings on June 26, 27 and 28, 1973. The announcements concerning these hearings indicated the focus would be on competition in the natural gas industry (see Subcommittee press releases, June 5, 8 and 20, 1973). However, the scope of the hearings extended to a number of other matters—understandably in light of the complexity of the reasons underlying the nation's natural gas shortage. The following comments are submitted, dealing with matters other than competition.

1. THE PROCEDURES INVOLVED IN VARIOUS REPORTS OF NATURAL GAS

In recent hearings before the Subcommittee on Antitrust and Monopoly, Senate Judiciary Committee, it has been alleged that the producing industry has under-reported natural gas reserves to the Federal Power Commission. Mr. James T. Halverson, Director of the Bureau of Competition of the Federal Trade Commission, made many such allegations, including the suggestion that the "procedure of reporting reserves through a subcommittee of the American Gas Association composed of employees of major producers could provide the vehicle for a conspiracy among the companies involved to under-report gas reserves * * *." Mr. Halverson based his observations largely upon alleged discrepancies between "proved" reserves figures of the AGA and the estimates of reserves made only by pipeline companies in their annual Form 15 Reports to the FPC.

These allegations reveal a basic lack of understanding of methods of reporting reserves. These methods and the related definitions differ widely, so that some reserves are much less definitive than others. For example, the methods of determination used for calculating "dedicated, remaining recoverable salable" reserves for Form 15 Reports submitted by interstate pipelines to FPC generally result in a reserve figure somewhat larger than the figure which would be reached through use of the more stringent definitional standards employed by the AGA in determining "proved" reserves.

The figures reached through the AGA method of determining "proved" reserves are based upon actual test flows, and therefore satisfy a specific definition. However, downward revisions to these estimates at a later date can and do occur as additional field performance characteristics become available. To demonstrate how reserve estimates can differ, a limited discussion of reserves classification will be helpful.

As stated at page 102 of *Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas in the United States and Canada and United States; Productive Capacity as of December 31, 1972* (prepared jointly by the AGA, American Petroleum Institute and Canadian Petroleum Institute, emphasis supplied):

"Proved reserves define the current estimated quantity of natural gas and natural gas liquids which analysis of geologic and engineering data demonstrate with reasonable certainty to be recoverable in the future from known oil and gas reservoirs under existing economic and operating conditions. *Reservoirs are considered proved that have demonstrated the ability to produce by either actual production* or conclusive formation test.

"The area of a reservoir considered proved is that portion delineated by drilling and defined by gas-oil, gas-water contacts or limited by structural deformation or lenticularity of the reservoir. In the absence of fluid contacts, the lowest known structural occurrency of hydrocarbons controls the proved limits of the reservoir. The proved area of a reservoir may also include the adjoining portions not delineated by drilling but which can be evaluated as economically productive on the basis of geological and engineering data available at the time the estimate is made."

When there are relatively few wells in a new field, it is likely that reserves estimates made by different experts will differ tremendously, depending upon the methods employed in making such estimates. The following quotation from page 104 of the above cited report is germane to this point:

"The drilling of additional wells in a reservoir not only delineates the productive area but also provides additional basic geological data. Estimates of porosity, interstitial water, pay thickness and other reservoir factors may be revised by new data. Analysis of the producing history of a reservoir, including production of oil, gas and water, and pressure performance results in more accurate concepts concerning the producing mechanism, recovery efficiency and the performance of the reservoir. *The composite of this new and improved information will yield more precise estimates of the ultimate recoveries and remaining reserves and result in revisions to previous estimates.* Changes in reserve estimates brought about the application of cycling or other recovery techniques are included in the revision to reserves. Also, changes in reserves resulting from a reduction in the estimate of the proved area are included in revisions."

These considerations make it imperative, in every comparison of reserves estimates, to inquire: "were the estimates made as of the same date and on the basis of the same data?" If the answers to these questions are not "yes," then comparisons of the estimates *are absolutely meaningless.*

The reserves reported to the FPC by interstate pipeline companies on Form 15 might in some instances encompass portions of all the reserve figures included in various classification methods. The figure that appears on Form 15 is an independent estimate reached by the buyer. Since these estimates are not confined to "proved" reserves, they should be expected to be larger than AGA estimates even if comparable on all other bases.

In comparing any two sets of reserves estimates, another essential question is whether the estimates were prepared for the same purpose. As is apparent from the earlier quotation, the AGA has a rather stringent definition of "proved" reserves. On the other hand, for certain purposes a company might desire an estimate of combined proved *and* probable reserves. Such purposes would include preparation of future budget and drilling programs. Thus, a company might ask its reserve estimators: "if we fully develop and drill so many wells in this field what can we predict in the way of reserves to be discovered?" Such forecasts of reserves would certainly not be a "proved" reserve estimate as defined by the AGA.

Since no allegation has ever been made that AGA "proved" reserves represent all reserves estimates made for all purposes, Mr. Halverson is completely unjustified in stating or implying that such figures are misrepresentations. His statements prove nothing more than that he does not understand the technical meaning of the word "proved."

In response to Mr. Halverson's reference to the AGA as a possible "vehicle for conspiracy," it should be noted that the National Gas Survey has conducted an investigation of natural gas reserves and concluded that its estimates of "proved" reserves were approximately 10% below the figures reached by the AGA. More information on the study of the National Gas Survey appears at page 16 of the direct testimony of Mr. Howard William Pifer, III, submitted to the Hart Subcommittee on June 26, 1973.

It should also be noted that Mr. Lewis A. Engman, Chairman of the Federal Trade Commission, at pages 6 and 7 of his direct testimony submitted on June 27, 1973 before this Subcommittee, described the FPC investigation of reserves by examining the field by field estimates made by each Southern Louisiana Subcommittee member of the AGA for the years 1966 through 1970. Therefore, Mr. Halverson's statement at page 4 of his above-mentioned testimony is misleading, to say the least, in stating that the FPC "relies solely on the company (without independent audit) to provide all the raw data * * *." Further, the FPC has conducted investigations in Docket No. R–405, through which it received data from all large producers regarding nationwide uncommitted gas reserves available for sale. The most recent investigation under this docket was instituted by an order issued September 12, 1972, and the results of this investigation revealed that producers were not withholding any substantial quantities of gas from the market.

2. UNCOMMITTED RESERVES DATA

Various witnesses at the hearings drew a number of questionable conclusions from data submitted by the FPC on volumes of uncommitted gas reserves. These uncommitted reserves data do not constitute any basis for the assertion that the industry is not competitive.

The volume of uncommitted gas reserves is not unreasonably large by any standard. The total uncommitted reserve figure as of the last date checked by the Commission, June 30, 1972, was 3.4 trillion cubic feet excluding Alaska. This compares with a total proved reserved figure for the United States excluding Alaska of 234.6 trillion cubic feet (as of December 31, 1972), or less than 1½ percent. When compared with production of natural gas, 22 trillion cubic feet for 1971), the uncommitted figure represents less than two months' gas supply.

There are logical reasons why there must be some inventory of "uncommitted" reserves at any given point in time. Reserves become "proved" when their existence is definitely established by the drilling of a well or acquisition of other geologic and engineering data which demonstrate with reasonable certainty their existence. They become committed when a contract is signed for their sale. After discovery and prior to commitment, the gas field must be developed by drilling of wells to a sufficient degree to establish a sufficient quantity of reserves to assure the pipeline purchaser that the necessary investment in pipelines and facilities is justified. In the case of smaller fields in areas remote from existing pipeline facilities, it may not be economic for the pipeline to undertake new construction needed for a connection until other discoveries are located nearby. Uncommitted reserves can be compared to a manufacturer's inventory of "goods in process"—they are on hand in a reasonable known quantity but not yet ready for sale. The fact that the present quantity of uncommitted reserves is so small compared to the total reserves is a cause for serious concern.

The process of discovery, development and commitment of new gas reserves is therefore a continuous process which occurs in the normal course of business. The reports to the FPC of the uncommitted reserves on a given date are analogous to clipping one frame out of a moving picture film. The reserves which are uncommitted, for example, on December 31, 1971, are not the same reserves shown as uncommitted on June 30, 1972. Many, if not most, of the reserves as of the first date have been committed to contract by the second date, and, in turn, replaced by other different newly discovered reserves. As a result, the grouping of uncommitted reserves into the "four largest companies," the "eight largest companies," etc. can be quite misleading.

The four largest companies on the first date are undoubtedly different companies than the four largest companies on the second date. This is suggested by Tables 6a, 6b and 6c to Chairman Nassikas' prepared statement. Furthermore, the four largest companies vary in identity between producing areas, so that the four largest in one area are not the same companies as the four largest in another area. Thus, the grouping attempted by Witness Wilson is completely misleading.

3. WELLHEAD SALES BY PRODUCERS TO INTRASTATE PURCHASERS SHOULD NOT BE SUBJECT TO FPC JURISDICTION

Since 1969 the vast majority of new reservers discovered in the United States have been committed to the intrastate market. Joseph Swidler, Chairman of the New York Public Service Commission, has stated: "In recent years intrastate buyers have in fact virtually monopolized new gas supplies." [1] The statement is not entirely accurate because it ignores those reserves committed to the interstate market under the Commission's Order 431, which has provided for the issuance of limited term certificates. These commitments amount to at least 421 billion cubic feet.[2] But it is safe to say that the vast majority of the new reserves discovered in this country since 1969, except for those discovered in the offshore federal domain, have been committed to the intrastate market. The issues to be considered are (1) the reasons why the intrastate market has been able to purchase the bulk of new gas supplies, and (2) what action, if any, Congress should take with reference to this market.

The obvious difference between an intrastate gas sales transaction and a comparable interstate transaction is that the latter is regulated by the Federal Power Commission. By nearly every pertinent test, including financial ability and tenacity in searching for new gas supplies, interstate buyers are at least as competent and aggressive as intrastate buyers. Therefore, it must be concluded that the basic reason why buyers in intrastate market have been able to purchase most of the newly discovered gas reserves in the last four years is because their purchases are not regulated by the Federal Power Commission. Accordingly, the intrastate market offers an interesting yardstick with which to test the plausibility of many of the charges and allegations made by witnesses in these proceedings. One such charge is that absent regulation by the Federal Power Commission, field prices of gas will rise without limit because producers are not effectively competitive. The broad range of gas prices in the intrastate market refutes this contention. Attached as Appendix A is a compilation of intrastate prices made by the Federal Power Commission Staff in two separate reports dated September 9, 1970 and November 8, 1971 in Rulemaking Docket No. R-389A. These summaries show that intrastate prices have risen gradually, reflecting market conditions when intrastate buyers were no longer able to obtain all of the gas supplies they needed merely by bidding against the FPC regulated price ceilings.

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[1] Statement of Joseph C. Swidler before the Senate Committee on the Judiciary, Subcommittee on Antitrust and Monopoly, June 26, 1973, p. 10.

[2] Source: Emergency contracts on file with the Federal Power Commission as rate schedules or as exhibits and certificate applications filed through September 5, 1972, certificated through August 31, 1972.

The second conclusion to be drawn from the intrastate market is that supply is responsive to price. Increases in intrastate prices were clearly a factor reflected in an increase in exploratory gas drilling in 1972. Because of the limited extent of the intrastate market, price increases in that market have not had the full beneficial impact on supply that removal of regulation on interstate prices would produce. Nevertheless, intrastate price increases, together with price increases permitted by recent Federal Power Commission orders, have begun to reverse the decline in exploratory drilling, a first step toward obtaining new gas reserves.

Closing their eyes to lessons provided by the intrastate market, industry critics advocate that independent producers' sales to intrastate buyers should be regulated by the Federal Power Commission. It is indeed ironic that the persons advocating this extension of regulatory jurisdiction are the same persons who were strongly instrumental in creating the current shortage through restrictive regulation of producers prices at the federal level.[3] The basic thrust of their position is that little expansion is to be expected in domestic gas supplies from expanded domestic exploration. Therefore, the Federal Power Commission should be given jurisdiction over the intrastate market, thus assuring the redistribution of current short inventories of gas supplies in the United States by eliminating a nonfederally regulated intrastate market. This would permit the interstate market to again compete effectively for what new supplies of gas would be forthcoming. This baffling position entirely overlooks the supply-eliciting function of increased prices, and assumes that prices have no effect on supply, an assumption which is demonstrably unfounded and contrary to experience in other facets of the American economy. Rather than relieve gas supply deficiencies through relaxation of Federal Power Commission price constraints and supply depressants, the Swidler-White approach would extend over all gas exploration the dead hand of interstate regulatory policies which have been operating as a deterrent in the interstate market.

Aside from the general adverse effect on supply which extension of regulation (rather than reduction of regulation) would have, the Swidler-White proposal contemplates a major reallocation of this country's natural resources. In all areas of the nation's economy and particularly in those industries relying upon natural resource extraction, industrial sites have been located near sources of feedstocks. It is sound economics to locate steel plants in the vicinity of coal mining operations, fish canneries in port cities, metal smelters near mine mouths and industries using extensive quantities of natural gas, such as chemical and gas industries, in the proximity of natural gas fields. This logical site selection process has gone on for many years, and substantial industries in gas producing states are directly dependent upon their supplies of local natural gas.

If prices of domestic gas are allowed to seek free market levels, such industries would gradually convert to other fuels or energy sources if conversion becomes economically required. But if the Federal Power Commission deprives these industries of their fuel supplies in order to provide natural gas to portions of this country to which it is not indigenous, or which have prohibited the development of natural gas in their own areas,[4] a great economic dislocation will result. By forcing artificial reallocation of natural resources from industries in states where resources are found to industries in other states, a whole series of complex business relationships will be disrupted, with consequential economic hardships difficult to measure.

It is not unreasonable to anticipate that in many areas, mines and industrial plants which have been constructed because of contractually assured supplies of adequate gas from intrastate suppliers will close their doors, and add workers to unemployment rolls rather than assume the immediate high cost of alternative energy sources. While some trends to reduce industrial gas consumption in the producing states must be regarded as inevitable, the competitive free market is perfectly equipped to accomplish this transition over a period of time with the least economic disruption. A massive reallocation of natural resources by administrative fiat could, on the other hand, wipe out and reverse economic gains which are so important to the nation's economy.

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[3] This position is argued most strongly by Joseph Swidler and Lee White, both of whom are former chairmen of the Federal Power Commission which, during their terms of office, imposed the restrictive pricing policies on interstate regulation which led directly to the gas shortage faced today.

[4] The New England States have strongly opposed the leasing of federal acreage in the Atlantic Shelf, offshore of New England, even though if gas were found in this area it would provide substantial quantities of that scarce product without the cost differentials of transported gas from the Southwest.

One additional point should be made. Those parties advocating expansion of Federal Power Commission regulation to the intrastate market fail to recognize that the intrastate market is not free from regulation. Most gas producing states have already adopted, or will shortly adopt, gas curtailment programs containing systems of priorities which allocate gas similar to the curtailment programs by the Federal Power Commisson.[5] Moreover, states largely regulate the intrastate gas market assuring domestic and small commercial consumers a first priority use of gas. This is not the type of situation contemplated by Congress when it enacted the Natural Gas Act to regulate in areas constitutionally prohibited to state regulation.

4. ALLEGATIONS WITH RESPECT TO NATURAL GAS MARKETING

In the course of their testimony in these proceedings, Messrs. Swartz, Halverson, and White have stated or suggested that producers, in an effort to justify a higher price for gas and in expectation that increased prices will be forthcoming, are consciously delaying the exploration, development, production, and sale of undiscovered gas reserves, thus creating the impression of a gas shortage.

To suggest that any responsible producer would by conscious design delay the prudent exploration, development, production, and sale of known and prospective natural gas reserves reflects complete ignorance of the stringent legal obligations imposed on a producer-lessee under the usual oil, gas, and mineral lease. These legal obligations give full effect to considerations of prudent operations, which in turn depend on such factors as prices of products, volume of production expected, and availability of markets. It would be irrational for producers to pursue the course of action suggested for the simple reason that if producers resorted to such "holding off the market" tactics they would suffer severe financial los due to the risk of money damage judgment or forfeiture or cancellation of valuable mineral leases.

To properly appreciate the issues involved and to place them in their proper perspective, it is essential to understand that the exploration and development of oil and gas properties has, with rare exception, occurred under the terms of oil, gas, and mineral leases. Such leases are the legal vehicles by which a producer-lessee acquires the right to enter upon the premises to explore for, and if found, to develop, produce, and market the oil and gas which may underlie the property described in the lease. For example, in Louisiana, the "exclusive right" to explore and develop lands for minerals, together with the concommitant right ultimately to produce and market same if found, belongs to the landowner or to a mineral servitude owner, and absent a lease granted by such parties a producer would not have the legal right to do any of these things unless he purchased the land or the mineral rights therein outright.

Under the terms of these leases the producer-lessee assumes certain express obligations to the lessor and there is additionally imposed by law, because of the nature of the basic relationship between lessor and lessee, a number of "implied covenants or obligations" which the lessee is bound to discharge, whether or not set out in the lease, on pain of suffering total or partial cancellation of the lease, monetary damages, or both.

These implied covenants or obligations are inferred or implied from the basic lessor-lessee relationship. Broadly stated, there exists in both common law jurisdictions and in Louisiana, where the civil law predominates, an equitable principle to the effect that if the compensation or consideration of one party to a contract depends wholly upon the diligent conduct of the other, the law implies a duty of diligent conduct even in the absence of an express contractual provision.

From this fundamental premise it is reasoned that since an oil and gas lease invests the producer-lessee with the "exclusive" right to drill on the land covered by the lease, and the lessor is contractually rendered powerless to exercise that right, the lessor's reasonable expectation of development of the mineral potential and the monetary return to be realized therefrom—repeatedly identified by our courts as the principal or primary consideration for granting the lease—should be afforded protection by law.

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[5] See Texas Railroad Commission curtailment order of January 3, 1973 in Gas Utilities Division, Docket No. R–489.

The jurisprudence has evolved several well-defined implied obligations. They are:

(1) The obligation to drill additional wells on the leased premises once production is established;

(2) The obligation to protect the leased premises from uncompensated drainage of oil and gas occasioned by wells located on adjoining lands; and

(3) The obligation to produce and market the oil and gas discovered on the leased premises.

The underlying premise of all these obligations is the recognition that pecuniary gain to the lessor—the principal consideration for the lease—depends entirely upon the diligent operation of the leased premises by the producer-lessee. If the lessee permits drainage to occur, this consideration is diminished. If the product once discovered is not marketed, no further consideration is received by the lessor. And, if the lessee fails to diligently explore and develop, the potential of the landowner's property is not fully realized. Once production is established the lessee is not permitted to rest on his laurels. To avoid the risk of judicial cancellation of his lease as to undeveloped areas, the lessee must within a reasonable period of time commence additional drilling operations to further develop the remainder of the leased premises. He must, in the words of one court, conduct all such operations as would a "reasonably prudent operator in the same or similar circumstances having due regard for the interest of both contracting parties." And, as stated a little differently by another court, "time and prompt development become of the essence of oil and gas contracts once production has been found."

The following brief quotation taken from the jurisprudence best express the essence of the rule, viz:

"The justification for the respondent's position is that the geologic data and the experience upon surrounding lands are both unfavorable to the discovery of oil or gas upon the east half of Section 16 (the 320-acre tract). The respondent's officers state that they desire to hold this tract because it may contain oil; but they assert that they have no present intention of drilling at any time in the near or remote future. This attitude does not comport with the obligation to prosecute development with due regard to the interests of the lessor. The production of oil on a small portion of the leased tract cannot justify the lessee's holding the balance indefinitely and depriving the lessor not only of the expected royalty from production pursuant to the lease, but of the privilege of making some other arrangement for availing himself of the mineral content of the land." *Sauder* v. *Mid-Continent Petroleum Corp.*, 292 U.S. 272, 54 S. Ct. 671, 78 L.Ed. 1255, 93 A.L.R. 454 (1934)

Other authorities in point are *Wier* 1. *Grubb*, 228 La. 254, 82 So. 2d 1, *Sohio Petroleum Company 1. Miller*, 237 La. 1013, 112 So. 2d 695, and *Fox Petroleum Co.* v. *Booker*, 123 Okla. 276, 253 Pac. 33, 38, quoted with approval in *Wier* v. *Grubb*, 82 So. 2d 1, 7.

The implied obligation to prevent drainage (sometimes referred to as the "off-set" obligation) imposes on a lessee the duty to prevent oil or gas from migrating in the confining subsurface formation to a producing well located on adjoining lands. In many common law states and Louisiana, the "rule of capture" prevails. This rule permits an adjoining landowner, or his mineral lessee, by conducting operations on such adjoining lands, to drain oil and gas from beneath the lands of a neighboring owner without incurring liability. This frequently occurs where a single reservoir underlies two adjoining tracts, a very common occurrence. The theory is that since neither landowner "owns" the oil and gas as they exist in the subsurface reservoir, either may, by conducting operations on his own land, "capture" the oil and gas by reducing it to possession at the wellhead and thus become its owner. Because of this rule it is an implied obligation of all mineral leases that the lessee, by the drilling of "off-set" wells, must prevent such migration of hydrocarbons or drainage from the leased premises.

Withholding of gas production from the market is virtually impossible because the producer cannot delay production if a reasonable market is available. Again the underling rule is that the lessee must operate the leased premises as a prudent administrator for the mutual benefit of lessor and lessee and is obligated to market the production at the best market price available, assuming there is a market. Actually, there is very little litigation on this point for several reasons. First and foremost is the fact that the lessee is anxious to begin receiving revenues. Secondly, because of the fact that a great many producing wells, both oil and gas, are more often than not completed in reservoirs from which other producers are also producing, curtailment of production would mean a monetary loss to the producer because of drainage. And thirdly, if production in paying quantities ceases for sixty or ninety days, depending on the lease terms, the lessee may lose the lease.

These implied obligations or covenants are generally applicable to leases granted by the State of Louisiana. The State Mineral Board, through its Fact Finding Committee, has devised an extremely efficient method for insuring compliance with those obligations. The Board early in its history adopted a philosophy of maintaining maximum flexibility as to operations expected of its lessees and chose instead to rely on the generally implied obligations, diligently enforced by the Fact Finding Committee and its supporting staff of highly trained technical personnel. This Committee continuously concerns itself with the implied obligation to market oil and gas, once discovered.

The state lease form, like other leases, permits the lease to be maintained by the payment of semi-annual shut-in rentals if there is located on the property covered by the lease, or on land unitized therewith, a well or wells capable of producing gas in paying quantities and gas is not being used or sold "because of the lack of a reasonable market or marketing facilities or governmental restrictions. . . ." Again, as is the case with most fee-lands leases, this clause can only be utilized where there is no available reasonable market, and the Lieu Royalty Committee, as a matter of course, reviews each lease being maintained by shut-in rentals every six (6) months to determine if a reasonable market has become available.

The State Mineral Board, through its Fact Finding Committee, Lieu Royalty Committee, and supporting staff, effectively exercises its supervisory authority to require diligence in the exploration and development of state leases and in the marketing of oil and gas discovered thereon.

Under Sections 5 and 8 of the Outer Continental Shelf Lands Act the authority to administer the outer continental shelf lands, and to grant oil and gas leases thereon, is vested by law in the Secretary of the Interior (Secretary), and the Secretary in turn has issued extensive leasing and operating regulations which are found in 30 C.F.R. 250 et seq., 43 C.F.R. 2234 5–3, and 43 C.F.R. 3380 et seq.

Section 3(c) of the federal oil and gas lease form spells out the drilling obligations imposed on the lessee. The provisions of the lease in this respect for the most part mirror the pertinent regulations, i.e., 43 C.F.R. 3387.3–2(a), 3387.3–2(c), and 3387.3–4 and 30 C.F.R. 250.33(a), 250.33(b) and 30 C.F.R. 250.34 and 250.35.

The federal lease form contains an express provision corresponding to the implied obligation to develop:

"After due notice in writing to diligently drill and produce such other wells as the Secretary may reasonably require in order that the leased area or any part thereof may be properly and timely developed and produced in accordance with good operating practices." (Section 3(c) (2)

If the lessee fails to comply with any provision of the lease, the Outer Continental Shelf Lands Act or the pertinent regulations, the lease is subject to cancellation. Under Section 5(b) of the Outer Continental Shelf Lands Act, 43 C.F.R. 3386.2, 30 C.F.R. 250.80, 250.81, and 250.82 and Section 10 of the lease, the Secretary, upon the giving of a thirty (30) day notice of default is authorized to cancel nonproducing leases, subject to judicial review. And in the instance of a producing lease, it may be canceled by appropriate proceeding before the United States District Court having jurisdiction. As noted previously, the lessor also has the right to invoke any other legal or equitable remedies available which may include the right to assert the forfeiture of the lease and a claim for monetary damages, or both, in the event a violation of the implied obligations can be shown.

With respect to the implied obligation to market once production is established on a federal lease, the same general rules apply and, unless a reasonable market is not available, the lessee must produce the well. In this connection, cognizance should be taken of Special O.C.S. Order No. 4, dated August 28, 1969, issued by the Supervisor pursuant to 30 C.F.R. 250.11 and 250.12 which permits the extension of a lease beyond its primary term even in the absence of actual production, where transportation facilities are not available to market the product, or a well capable of producing has been abandoned temporarily to facilitate proper development by the construction of a platform or otherwise. Under O.C.S. Order No. 4 the Supervisor may approve a suspension of production and extension of the lease provided at least one well has been drilled on the lease and determined to be capable of being produced in paying quantities. The order thereafter sets out fairly detailed criteria which must be met in order for the well to qualify as a well capable of producing in paying quantities. During the period of such suspension, the lessee must continue to pay rental or minimum royalty fixed at the discretion of the Supervisor and such payments may not be recouped out of subsequent production royalties. In summary, it is fair to say that the basic obligations imposed on the lessee under a federal lease covering outer continental shelf lands are not materially different from those which arise under the ordinary fee-lands lease or the leases used by the State of Louisiana.

The foregoing analysis is important not merely because it demonstrates the error of certain arguments but more so because it underscores the danger of placing any substantial credence upon the views of persons who are totally unaware of the circumstances under which exploration, production, and marketing of natural gas take place.

5. THE PROPOSAL TO CREATE A GOVERNMENT CORPORATION FOR GAS DEVELOPMENT ON FEDERAL LANDS

It has been proposed that a government corporation be formed to drill for gas on federal lands. (See, e.g., Testimony of Lee C. White, Senate Subcommittee on Antitrust and Monopoly, June 26, 1973, Tr. 465–67.) The reasons asserted in justification are (i) that the goal of the government corporation would be to produce gas for consumers, not to make a profit, (ii) that such government corporation would receive a greater degree of public confidence than a private corporation, particularly as to environmental matters, and (iii) its costs of finding and producing gas would provide valuable data.

This proposal, while having surface plausibility, has obviously not been thought through carefully. Before any credence can be given to such proposals, the proponents should be required to answer such questions as the following:

(1) Where do the geologists and geophysicists come from? Most such trained personnel work for existing gas producers, so if hired away the ability of existing gas producers to explore for new gas supplies is simultaneously reduced, with no net benefit to anyone.

(2) How does the government corporation obtain leases? If they are cost free, how can the corporation's experience provide data comparable to private companies? If the government corporation has to bid in competition with private companies, but with limitless funds from the public treasury and without the discipline of profit-orientation, it can outbid private companies and its cost experience will be meaningless.

(3) What if the government corporation finds oil instead of gas or finds both on the same leases? (The ability of geologists to search for the two products seperately is not perfect.) To estimate the cost experience for gas when oil is produced jointly requires wholly arbitrary cost allocations over which the FPC has struggled for 15 years.

(4) If the government corporation pays for its leases, where does it get the funds? By transfer from one account to another on Treasury Department books? This would result in the same lack of bidding discipline as noted earlier. By borrowing or equity funding in the public money market? If by borrowing, government guarantees would be needed since the corporation would have no assets and, since such guarantees are not available to private corporations, any capital cost experience would be noncomparable with that of private companies.

(5) Where does the government corporation obtain drilling rigs and related services? Presumably by hiring independent drillers as do most private companies. This does two things—make rigs scarce for a period which helps no one, and costs the government the same as private industry so no new cost information is provided.

(6) How long does it take for gas production by the government corporation to reach a significant level? Many companies have been operating in the Gulf of Mexico for over 20 years and have spent literally thousands of man-years studying geology and operations in the area. If studied from scratch, the government corporation would require 5 to 10 years to be a competent operator. If this expertise is "bought" by hiring from private companies, then the government corporation cannot provide any "independent" information.

(7) What happens to gas production found by the government corporation? Presumably it is delivered to one or more interstate pipelines for their markets. But which pipeline or pipelines? Would the government corporation or the FPC have to consider comparative "need" for every new sale? At what price would this gas production be sold, At the government corporation's cost? In early years when production volumes are low and unproductive investment high, the cost could be astronomical. Each increment of production (i.e., separate discovery) would have a different cost with strange results to the pipeline purchaser, or purchasers. Would its gas be priced at area rates, the same as private gas producers? Or at market value? If so, then there is no cost saving to consumers in either case, so why have a government corporation? If sold at less than area rates or market value, who decides which pipeline gets the bargain?

(8) If the goal of the government corporation is to produce gas, not to make a profit, where is the concept of consumer protection? Does this mean produce gas at any cost but sell it at low cost? If so, it simply means that the general treasury pays part of the consumer's cost of gas. Yet there is general agreement that the underpricing of gas has resulted in inefficient uses of gas—which continued underpricing will perpetuate.

(9) The history of oil and gas exploration is replete with examples of major discoveries made on geological prospects which had been condemned as unproductive by earlier explorers. If massive amounts of acreage are subjected to exploratory scrutiny of only one company (i.e., the government corporation), the result will be a failure to find significant new reserves. Only the divergent views available in the competitive private company exploratory system can insure maximum and timely discovery of reserves.

(10) A government corporation would not be either better able or better motivated to meet environmental responsibilities. Otherwise, why do we see the present widespread litigation concerning the environmental impact of Corps of Engineers flood control and hydroelectric projects? Objections to environmentally sensitive projects obviously arise from the nature of the projects, not from the identity of the person involved.

(11) It has been estimated that less than 5% of all federal lands (including offshore federal domain) have been leased for oil and gas exploration. Obviously a government corporation could not undertake to explore all of the unleased areas within any reasonable time frame. But then, if the government corporation took only a portion, how would its lease be selected? If it took only the most desirable leases, incentives for private company exploration would be diluted. If it took only the least desirable leases, the cost of oil and gas found could be so high that it could not be sold, except at a loss. In either instance, the information obtained would be noncomparable with the experience of private companies.

(12) How can formation of a government corporation alleviate the dual reasons for declining private industry gas exploration: inadequate economic incentives and restrictions on availability of acreage for exploration? The government corporation is not suggested as a substitute for but as a supplement to private activities. Therefore, its mere creation cannot cure the conditions which have led to past inadequate exploratory levels on the part of private companies.

APPENDIX A-1

DOCKET NO. R-389A, WEIGHTED AVERAGE RATES AND RANGE OF RATES FOR INTRASTATE SALES UNDER CONTRACTS DATED ON AND AFTER JULY 1, 1970

Area and subarea	Annual volume	Cents per thousand cubic feet					
		Contract rates [1]		Contract rate plus tax reimbursement [3]		Current price [4]	
		Weighted average [2]	Range	Weighted average [2]	Range	Weighted average [2]	Range
South Louisiana	[5] 24,810,447	26.02	17.20-29.50	26.16	19.50-29.50	26.22	20.25-39.56
Other Southwest:							
Arkansas							
Louisiana north	[6] 315,546	20.58	19.5 -21.45	20.58	19.50-21.45	20.58	19.50-21.45
Mississippi							
Oklahoma	[7] 37,839,579	25.64	11.00-27.00	25.73	11.17-27.56	27.13	11.17-28.92
Texas Railroad District 5	[7] 9,864,600	21.43	19.00-25.00	21.43	19.00-25.00	21.80	18.00-27.45
Texas Railroad District 6	[7] 4,035,000	20.00	20.00	20.00	20.00	15.72	4.40-18.30
Texas Railroad District 9							
Area total and weighted average	[7] 52,054,725	24.37	11.00-27.00	24.44	11.17-27.56	25.21	4.40-28.92

Hugoton-Anadarko:							
Kansas	[7] 1,116,700	19.00	19.00	19.00	19.00	18.91	18.30-19.00
Oklahoma	[7] 35,281,219	20.54	14.00-25.00	20.84	14.21-25.00	22.99	9.25-35.36
Texas Railroad District 10	[7] 8,782,953	22.36	21.00-25.00	22.36	21.00-25.00	21.78	20.69-25.00
Area total and weighted average	[7] 45,180,872	20.86	14.00-25.00	21.09	14.21-25.00	22.65	9.25-35.36
Texas Gulf Coast:							
Railroad District 2	[7] 9,627,007	19.57	16.00-25.00	19.57	16.00-25.00	19.42	16.00-25.00
Railroad District 3	[7] 32,725,806	21.20	13.00-25.00	21.22	13.00-25.00	21.67	11.00-26.00
Railroad District 4	[7] 32,687,181	22.20	16.00-26.25	22.27	16.00-26.25	23.53	13.00-30.11
Area total and weighted average	[7] 75,039,994	21.42	13.00-26.25	21.46	13.00-26.25	22.19	11.00-30.11
Appalachian:							
Michigan	[5] 18,568,000	39.14	36.00-43.00	39.14	36.00-43.00	40.87	36.00-48.30
Ohio	[8] 2,737,815	43.41	38.00-44.12	43.41	38.00-44.12	43.64	40.00-44.12
Pennsylvania	[8] 203,993	39.22	39.22	39.22	39.22	39.22	39.22
Area total and weighted average	[5] 21,509,808	39.68	36.00-44.12	39.68	36.00-44.12	41.21	36.00-48.30
Rocky Mountain [9]	[6] 20,283,981	16.89	9.75-25.00	16.90	9.75-25.00	17.32	6.00-25.00
Texas District No. 1	[7] 3,102,535	20.00	20.00	20.00	20.00	23.31	20.80-27.58
California	11,078,410	34.21	28.50-37.00	34.22	30.00-37.00	34.09	27.00-37.00
Permian Basin	[7] 137,322,482	24.06	11.00-26.50	24.07	11.00-26.00	23.90	8.96-28.50
Total	390,383,254						

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[1] Rate stated in the contract.

[2] The term "weighted average" is defined as the sum of the annual volume of each contract multiplied by the applicable rate of each contract in an area or subarea and divided by the total annual volume of all contracts in the area or subarea.

[3] Rate stated in the contracts plus the current tax reimbursement received or contractually due.

[4] Current price received inclusive of tax reimbursement, additive, and deductive adjustments for gathering and Btu. It does not include any allowance with respect to take or pay contractual provisions.

[5] Rates, prices, and volumes at 15.025 lb/in²a.

[6] Rates, prices, and volumes converted from 15.025 to 14.65 lb/in²a.

[7] Rates, prices, and volumes at 14.65 lb/in²a.

[8] Rates, prices, and volumes converted from 15.325 to 15.025 lb/in²a.

[9] Includes Montana, Wyoming, Utah, and Colorado.

APPENDIX A-2

DOCKET NO. R-389A, WEIGHTED AVERAGE RATES AND RANGE OF RATES FOR INTRASTATE SALES UNDER CONTRACTS DATED ON AND AFTER SEPT. 15, 1971

Area and subarea	Annual volume	Cents per thousand cubic feet							
		Contract rates [1]		Contract rate plus tax reimbursement [3]		Current price [4]		Adjusted price [5]	
		Weighted average [2]	Range	Weighted average [2]	Range	Weighted average [2]	Range	Weighted average [2]	Range
South Louisiana	[6] 16,624,876	28.62	22.00–35.00	29.47	22.00–35.00	29.47	22.00–35.00	29.38	21.06–35.00
Other Southwest:									
Arkansas, northern	[7] 6,913,285	21.50	21.50	21.50	21.50	21.50	21.50	21.37	19.69–21.50
Louisiana, north	[8] 399,214	24.38	24.38	24.69	24.38–24.86	24.69	24.38–24.86	24.69	24.38–24.86
Mississippi	[8] 16,748,000	47.59	21.45–51.68	47.59	21.45–51.68	45.26	21.45–48.46	45.26	21.45–48.46
Oklahoma	[7] 970,000	23.54	23.00–27.00	23.85	23.34–27.00	23.65	23.34–25.49	21.14	19.30–25.49
Texas Railroad District 5	[7] 6,638,070	23.50	23.50	23.50	23.50	23.50	23.50	22.81	19.44–23.50
Texas Railroad District 6	[7] 5,412,368	26.64	20.00–35.00	26.68	20.00–35.50	26.84	10.26–37.60	26.36	10.26–37.60
Texas Railroad District 9	[7] 146,000	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00
Area total	[7] 37,226,937	34.41	17.00–51.68	34.44	17.00–51.68	33.40	10.26–48.46	33.11	10.26–48.46
Hugoton-Anadarko:									
Kansas	[7] 1,225,000	21.51	21.00–26.00	21.51	21.00–26.00	22.33	15.60–23.10	22.33	15.60–23.10
Oklahoma	[7] 36,136,443	26.28	14.00–40.00	26.53	14.00–40.00	27.89	14.00–40.00	26.69	14.00–40.00
Texas Railroad District 10	[7] 4,481,158	33.75	32.00–35.00	33.75	32.00–35.00	33.22	32.00–34.09	33.22	32.00–34.09
Area total	[7] 41,842,601	26.94	14.00–35.00	27.15	14.00–40.00	28.29	14.00–40.00	27.26	14.00–34.09

Texas Gulf Coast:									
Railroad District 1	[7] 210,000	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Railroad District 2	[7] 24,836,696	34.97	30.00-35.00	34.97	30.00-35.00	36.22	30.00-37.91	36.22	30.00-37.91
Railroad District 3	[7] 44,766,470	29.61	20.00-43.50	29.69	20.00-43.50	30.03	20.00-45.40	29.98	20.00-45.40
Railroad District 4	[7] 18,299,044	26.58	17.00-35.00	26.58	17.00-35.00	26.80	17.00-35.00	26.40	17.00-35.00
Area total	[7] 88,112,210	30.47	17.00-43.50	30.51	17.00-43.50	31.08	17.00-45.40	30.97	17.00-45.40
Appalachian:									
Michigan	[9] 28,330,407	47.24	43.00-53.00	47.24	43.00-53.00	48.26	46.00-53.75	48.26	46.00-53.75
Ohio									
Pennsylvania									
Area total	[6] 28,330,407	47.24	43.00-53.00	47.24	43.00-53.00	48.26	46.00-53.75	48.26	46.00-53.75
Rocky Mountain [11]	[10] 9,660,165	27.76	15.00-35.90	27.76	15.00-35.90	30.67	15.00-43.08	29.49	15.00-43.08
Alabama and Florida	[7] 2,785,000	51.51	35.00-56.00	51.51	35.00-56.00	68.64	40.95-76.16	68.64	40.95-76.16
California	[12] 2,169,635	34.77	34.00-35.00	34.77	34.00-35.02	33.57	30.00-37.00	33.57	30.00-37.00
Permian Basin	[7] 143,437,507	29.97	14.00-37.00	29.97	14.00-37.00	28.78	14.00-49.00	27.88	14.00-49.00
Total	370,189,338								

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[1] Rate stated in the contract.

[2] The term "weighted average" is defined as the sum of the annual volume of each contract multiplied by the applicable rate of each contract in an area or subarea and divided by the total annual volume of all contracts in the area or subarea.

[3] Rate stated in the contracts plus the current tax reimbursement received or contractually due.

[4] Current price received inclusive of tax reimbursement, additive, and deductive adjustments for gathering and Btu. It does not include any allowance with respect to take or pay contractual provisions.

[5] Lesser of current price as defined in [4] or price allowed by Economic Stabilization Act of 1970 and Executive Order No. 11615 as amended.

[6] Rates, prices, and volumes at 15.025 lb/in ²a.

[7] Rates, prices, and volumes at 14.65 lb/in ²a.

[8] Rates, prices, and volumes converted from 15.025 lb/in ²a to 14.56 lb/in ²a.

[9] Rates, prices, and volumes for a portion of the gas converted from 14.73 lb/in ²a to 15.025 lb/in ²a.

[10] Rates, prices, and volumes for a portion of the gas converted from 14.65 lb/in ²a to 15.025 lb/in ²a.

[11] Includes Colorado, Wyoming, New Mexico, and Utah.

[12] Rates, prices, and volumes at 14.73 lb/in ²a.

Exhibit 4—Response of James T. Halverson to Comments of W. O. Senter (exhibit 3)

FEDERAL TRADE COMMISSION,
BUREAU OF COMPETITION,
Washington, D.C., February 1, 1974.

Mr. W. O. SENTER,
Executive Vice President,
Gas Supply Committee, Washington, D.C.

DEAR MR. SENTER: By letter to me dated July 18, 1973. Senator Hart has transmitted your comments "On Certain Matters Raised During Hearings On Natural Gas June 26, 27 and 28, 1973," so as to provide me with an opportunity to evaluate your comments and reply to them in writing for the hearing records. This letter replies to those portions of your comments which relate to the remarks made by me on June 27, 1973 before the Senate Subcommittee on Antitrust and Monopoly. In replying to you, I am requesting that Senator Hart make a copy of this letter a part of the record of the Subcommittee's hearings into competition in the energy industry. This reply reflects my own personal views; it does not constitute an official statement by the Federal Trade Commission.

As background to my statements before and to the information submitted to the Subcommittee, I note that Chairman Engman received a letter from Senator Hart on July 5, 1973. This letter requested a detailed report on all Commission investigations relative to energy including an investigation, styled In the Matter of the American Gas Association, et al., File No. 711 0042, which relates to the reporting of natural gas reserves. I am enclosing a copy of Senator Hart's letter. Chairman Engman directed me and I directed members of the Bureau of Competition to prepare a report as requested by Senator Hart. This staff response was transmitted to the Subcommittee on June 19, 1973 and I shall henceforth refer to it as the Staff Memorandum of June 19.

Senator Hart also requested that Chairman Engman, I and certain staff members appear on June 27 before the Subcommittee to testify and answer questions regarding pending Commission energy investigations. In preparing the Staff memorandum of June 19, and in the preparation of my testimony, care was taken to avoid any disclosure of information protected by either the Commission's Rules of Practice or by the "Commitment of Confidentiality" extended by the Commission to any company in connection with File No. 711 0042.

At page two of your comments you state that observations by me that the producing industry has under-reported natural gas reserves to the Federal Power Commission, and that the procedures of the American Gas Association could provide the vehicle for a conspiracy to under-report reserves, were both based "largely upon alleged discrepancies between 'proved' reserves figures of the AGA and the estimates of reserves made only by pipeline companies in their annual Form 15 Reports to the FPC." The attribution of this basis to my observations is inaccurate. My belief that the AGA could provide a vehicle for conspiracy is based upon the procedures and organization of the AGA for reporting reserves as those procedures and that organization are outlined at pages 224–25 of the transcript of my remarks. My belief that producers have seriously under-reported reserves to the AGA is based in large part upon comparisons of internal company documents maintained by two producers who have completely complied with our subpoenas (e.g., reserves kept for tax purposes see Tr. 227–28), with AGA estimates. As I noted in my remarks (Tr. 226), discrepancies between Form 15 figures and AGA figures led to the drafting of subpoenas in the Bureau's investigation, but "The theory of the investigation was to compare the reserve estimates used by the companies for internal purposes with the estimates submitted to the American Gas Association . . . ." Estimates for internal company purposes include but are not limited to Form 15 estimates; to date, staff has made only limited use of Form 15 data.

However, staff does look upon Form 15 estimates as useful tools for gauging the accuracy of AGA estimates. At page four of your comments, you intimate that Form 15 estimates should exceed AGA estimates for the same tract because the former include probable reserves. While some pipeline companies may include probable reserves in their estimates of dedicated (Form 15) reserves, there is no reason to assume that all or even many do so. There has been testimony during our investigation that pipelines have for years deliberately under-estimated reserves in connection with their negotiations for purchasing gas, and staff has noted instances in which producer estimates of *proven* reserves have exceeded Form 15 estimates for identical tracts.

Your statement (page four)—that comparisons of estimates not made at the same date and based on the same data are meaningless—flies in the face of the AGA and Federal Power Commission practice of comparing annual AGA estimates; the practice of producers of booking annual field by field estimates; and the comparisons made by the Federal Power Commission of estimates compiled in the course of its National Gas Survey with AGA estimates.[1] Further, AGA estimates for a given year, say 1968, are compiled in the following year, e.g., 1969. Most company estimates for 1968 are made in 1968. This means that any new discoveries, developments or revisions occurring during a year should be reflected in the AGA estimate for that year, although not necessarily in all company estimates for that year. Accordingly, in the absence of negative revisions (the AGA affirmatively reveals negative revisions), AGA estimates for a particular year should equal or exceed comparable company estimates for that year. It is noted that the Commission subpoenas issued to the eleven producers call for back-up data for all estimates submitted. When a large difference exists between a company and an AGA estimate, this back-up data will be examined, particularly when the difference exists as an isolated instance as distinguished from a trend over a period of years.

At page five of your comments you state that because no allegation has been made that AGA estimates of proved reserves are made for all purposes, I was not justified in stating or implying that AGA figures are misrepresentations. This apparently is a reference to conclusions by me of AGA under-reporting based upon comparisons of AGA estimates with producer in-house (company) estimates. Your point seems to be that AGA estimates cannot be compared with company estimates unless both were made for the same purpose. The only reasons you cite for the incompatability of AGA and company estimates appear at page four—that "the AGA has a rather stringent definition of 'proved' reserves" and that company estimates may combine proved and probable reserves.

On June 27 I explicitly stated (Tr. 227) that the AGA definition of proved reserves "is also the definition employed by the [producing] companies." The stringent definition of proved reserves employed by the AGA is thus also followed by the producers. Your concern over the inclusion of probable reserves in comparisons of proved reserves has also been voiced by Gulf Oil Corporation, and I have responded to Gulf as follows:

> I wish to assure Gulf that in comparing various reserve compilations appearing in Gulf documents, staff did not compare potential reserves with proved reserves. In comparing AGA estimates with Gulf book reserves and other estimates, only those estimates which Gulf labeled as "proved" were compared. Accordingly, the concern expressed at pages 8 and 9 of Gulf's Response over staff inexperience in handling reserve figures is unwarranted.

This is to assure you that staff, in utilizing the documents of producers other than Gulf, will continue to differentiate between proved and potential including probable reserves.

As you note (page five), the Federal Power Commission has conducted an investigation of natural gas reserves, the "National Gas Survey" (NGS) and in its report thereof ("National Gas Reserves Study") has concluded that its estimates of proved reserves were approximately 10% below the figures reached by the AGA. I have commented to Dr. Paul J. Root of the National Gas Reserve Study (NGRS) with regard to this Study as follows:

> The NGRS presents an estimate of the proved reserves of natural gas in the United States as of December 31, 1970. As you indicate (page two), of the 6,358 gas fields identified by the NGS, all 108 fields thereof reported by the AGA to contain 400 Bcf (billion cubic feet) of gas or more (referred to in the NGRS as the "certainty sample") were surveyed, but only 50 of the 6,250 "under 400 Bcf" fields were surveyed. It is noted that the 6,250 fields were divided into six stratum according to the amount of reserves of gas in each field as reported by the AGA, and that the 50 fields were then randomly selected from these strata, with the number drawn from any one stratum determined in part by standard deviation figures derived from AGA reserve estimates for the fields in the strata.
>
> Based upon this survey of 158 fields, the NGRS concludes (Appendix VI, page 25) that "the estimate of statistical reliability attributable only to sampling can be expressed by stating that there is 95 percent confidence that the reserves lie within 22.0 TCf [Trillion cubic feet] (or 10 percent) of 228.5

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[1] At page five of your comments (see *infra*) you cite with approval a comparison by the Federal Power Commission of its own estimates of proved reserves with AGA estimates.

Tcf." I have no quarrel with this statement as a mathematical expression, but I am highly concerned with the sampling procedures that underlie it. Specifically, I am concerned that the sampling was weighted toward fields in which AGA under-reporting was least likely to occur and that few if any fields were surveyed in which AGA under-reporting was most likely to occur.[2]

Staff of the Bureau of Competition has reviewed AGA estimates of fields in the Offshore Area of South Louisiana and has concluded that tracts reported by the AGA to contain relatively small amounts of reserves are most frequently the ones that are most seriously under-reported.[3] This suggests that had the purpose of the NGS been to examine critically the accuracy of AGA figures, the certainty sample would have been drawn from among those fields reported by the AGA to contain relatively small amounts of natural gas. Instead, the certainty sample was drawn from the fields reported by the AGA to have the most gas and this bias was continued throughout the strata. Thus the NGS sampled .21% of the fields in the 0–1 Bcf and 1–5 Bcf stratum, .41% of the 5–10 Bcf strata, 1.25% of the 10–50 Bcf strata, 3.53% of the 50–200 Bcf strata, 4.95% of the 200–400 Bcf strata, and as noted, 100% of the over-400 Bcf strata. In all, only 26 of the 5,620 fields reported by the AGA to be under 50 Bcf in size were surveyed.

The relatively under-developed, significantly under-reported fields have been as might be anticipated, fields with comparatively recent discovery dates. However, the NGS rejected stratification by discovery data. As a result, only 18 of the 50 randomly selected fields had discovered dates as recent as 1960–1970, and there is no way of knowing from any published data from which strata these 18 were drawn.

Further, the Federal Power Commission is well aware that AGA under-reporting is particularly suspect in Offshore South Louisiana, as well as in the Rocky Mountain region and Alaska.[4] Notwithstanding this fact, the NGS rejected stratification based on geographic distribution. As a result, only nine of the 50 randomly selected fields were located in Offshore South Louisiana and in the Rocky Mountain region, with none being drawn from Alaska. Whether any of the nine were drawn from fields with discovery dates as recent as 1960–1970 and from the 50 Bcf and under stratum is unknown.

The selection of only 26 fields out of 5,620 in the suspect 50 Bcf and under stratum, with only a few if any having been drawn as well from the suspect geographical regions and the suspect discovery date group, is in my opinion a prescription for overlooking AGA under-reporting. As the NGRS acknowledges, usage of a confidence interval requires some degree of normal or symmetrical distribution (NGRS, Appendix VI, page 26) and failure to adequately sample from population stratum introduces the possibility of major error in estimating these stratum (NGRS, Appendix VI, page 18). The meager random sampling by the NGS not only fails entirely to recognize the possibility of asymmetry in population due to AGA under-reporting, but it leans over backwards to avoid discovering it.

It was the Federal Power Commission's concern over the accuracy of reserve reporting in Offshore South Louisiana that led to the mailing of questionnaires, on August 14, 1969, to producers requiring them to furnish detailed information on reserves in all fields (over 200) in that area. Producer opposition to these questionnaires resulted in FPC abandonment of this inquiry. The Federal Trade Commission investigation seeks much of the same information from producers which the FPC sought. Until a field by field check is made on all AGA estimates for Offshore South Louisiana, and possibly of the San Juan and Uinta-Green River sub-areas of the Rocky Mountain region and of Alaska as well, the NGS estimate, like the AGA estimate, will remain suspect.

The NGS limited its sampling from small fields and eschewed stratification by geographic area and field discovery data in part through reliance on

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[2] The significant role played by producers in establishing the procedures by the NGS to estimate proved reserves is summarized in an attachment hereto.

[3] The Federal Power Commission has apparently also been suspicious of AGA under-reporting of reserves in these comparatively undeveloped fields, as witness its uncommitted gas reserves study made in connection with the South Louisiana rate case.

[4] E.g., see [FPC] Staff Counsel's answer in Opposition to Petition to Reopen Proceedings, pp. 3–4, AR69–1 as regards Offshore South Louisiana and Appendix A of FPC Order No. 435 regarding the Rocky Mountain region. The AGA has admitted publicly that its 1968 and 1969 estimates of proved reserves were under-reported by 26 Tcf.

> standard deviation figures derived from AGA reserve estimates. Your conclusion (page five) that any distortions through the use of AGA figures would have relatively little effect on projected total reserves, because the standard error "takes into account variability of measurements within strata," misses the point that the "standard error" takes into account only such variability as its sampling method is designed to detect. A check on the accuracy of critical AGA figures might have revealed, as our investigations has thus far revealed, far more deviation than AGA figures in fact reflect. This check, which could well have dictated a radically different approach to sampling, was never made.

At another point in my letter to Dr. Root, I make the following additional statement regarding the NGS and NGRS:

> If the NGS had required producers to furnish their own in-house estimates and back-up calculations, as we have required in our investigation, NGS personnel would have been in a far stronger position to assess whether all relevant raw data had been made available to them upon which to base an estimate. Likewise, if raw data had been sought from more than one producer in each field as was not the case with the NGS, NGS personnel would have had an additional check on whether all relevant raw data had been furnished.
>
> One further comment on the NGS before turning to your comments on my remarks of June 27. The NGS assigned the task of compiling a list of gas fields not reported by the AGA to the Oil Information Center (OIC) of the University of Oklahoma Research Institute. The NGS directed the OIC to perform this task by using its "data base" and other information sources—each of the other information sources that was specified is a government publication (see NGRS, Appendix II, page 1). The apparent sources for the data base itself were government production reports (in the 12 states that publish them) and otherwise, the International Oil Scouts Annual Review (see NGRS, Appendix III, pages 3–5).
>
> It is dubious whether production reports are the best sources for locating fields not in production. The Oil Scouts is a producer organization subject to the same influences as the AGA subcommittees which estimate reserves. While government publications may be useful sources for compiling a universe of gas fields, staff members of the Bureau of Competition have found no source in this regard equal to the unpublished well drilling, testing and completion reports maintained by the Federal and State governments—apparently the OIC overlooked this source. Further, our investigation has uncovered a number of instances in which temporarily abandoned reservoirs contained gas in paying quantities which was not reported to the AGA. Notwithstanding this, the OIC systematically eliminated all "abandoned or temporarily abandoned fields or pools" (NGRS, Appendix III, page 7) from its list of gas fields to be estimated by the NGS.

Referring again to page five of your comments, you there criticize my statement (Tr. 226) that the FPC should independently audit company raw data, by noting that Chairman Engman of the Federal Trade Commission described (at pages 6 and 7 of his Statement: Tr. 201–202) an FPC investigation of AGA estimates for 1966–1970. Apparently you view an investigation of AGA estimates as tantamount to an audit of company raw data. In any case, the investigation noted by Chairman Engman refers to one made by the Federal Trade Commission, not by the Federal Power Commission. It was the FTC as part of the instant investigation into AGA reporting, not the FPC, that first gained access to AGA field-by-field estimates. This fact is made clear by Chairman Engman's very next sentence:

> Because of their confidentiality a third-party arrangement was agreed upon whereby the documents would remain at Price-Waterhouse but *Bureau of Competition* [of the FTC!] attorneys would have possession of and access to, the field-by-field estimates (italics added).

As further evidence of FPC auditing of producer reserves, you cite Docket No. R–405, which you describe (page five) as an inquiry into nationwide uncommitted gas reserves available for sale by large producers. This inquiry not only exempted proved reserves which are committed to interstate pipelines (an estimated 70% of total proved reserves), but also proved reserves held for direct industrial contracts, company use-warranty, and company use-fuel and feedstock. I have commented to Gulf Oil Corporation with regard to these exemptions as follows:

> All proved reserves, whether or not "available for sale," should be reported to the AGA. Thus, proved reserves committed contractually or otherwise considered to be available for sale would not be reported in response to the FPC's Questionnaire, but should be reported to the AGA. It is interesting to note that even proved reserves existing on an as yet non-producing lease, may be committed contractually several years before the lease is in production, hence not subject to the FPC Questionnaire, but of course still subject to being reported to the AGA. In addition, testimony regarding a previous FPC Questionnaire raises some doubt whether uncommitted proved reserves existing on a lease that has no transportation facilities are considered by producers to be "available for sale." If so, these reserves would also not be reported in response to the FPC Questionnaire, but still should be reported to the AGA.
>
> In Docket No. R–405, the FPC relies on producer statements and does not require back-up data. You fail to cite however, the first FPC inquiry into uncommitted gas reserves available for sale—that inquiry was in connection with AR69–1, the second South Louisiana area rate case, and did involve FPC auditing. Mr. Lawrence R. Mangen of the Federal Power Commission testified in AR69–1 as to the procedures utilized in connection with this uncommitted reserve study. According to his testimony, no data was taken from producer offices (Tr. 5200), all work papers were destroyed once the examination was completed (Tr. 5200, 5430), the staff examined only one-third of the uncommitted reserves reported to be available for sale as of December 31, 1969[5] (Tr. 5201); the producers themselves supplied the audit team with the list of reservoirs to be checked (Tr. 5456); producers who reported any uncommitted reserves were not checked to see if they reported such reserves for all of their fields (Tr. 5446); FPC staff spent a total of 18 man days checking out uncommitted reserves of producers failing to report any such reserves (Tr. 5203) and apparently confined these efforts to discovery, as opposed to developmental well drilling (Tr. 5452–5453).[6]

All in all, I believe that the various inquiries hitherto undertaken by the Federal Power Commission concerning the amount of proven reserves of natural gas that are extant have been highly useful as regards the purposes for which they were undertaken, but that they do not constitute and never were intended to constitute a review of the accuracy of AGA reporting. Further, because they fail to provide an adequate basis by which to determine such accuracy, and because the marshalling of facts with regard to this nation's energy crisis is of the highest priority, there is a pressing need for full, expeditious, implementation of the Commission's inquiry into this matter.

At pages 13–21 of your comments, you compile and discuss the various obligations which mineral lessees owe to their lessors and conclude (pages 20 and 21) that the obligations of lessees of federal offshore lands do not differ materially from those owed by other mineral lessees. This discussion is the predicate for your stated view (page 13) that it would be irrational for producers to withhold production and thereby breach obligations which could give rise to legal actions.

The first answer to this contention is that there is no legal obligation for producer-lessees to report reserves accurately to the AGA, even should they produce them. Secondly, the risk of legal action must be weighed against the possible gain—I note that jurisdictional wellhead prices for new natural gas in Offshore South Louisiana have risen from the 17¢ Mcf rate (established by the FPC for a five year period in AR61–2, decided in 1969) to rates as high in some instances as 45¢ Mcf. Thirdly, as with so many dejure arguments, the contention simply does not square with the facts. As I have noted (Tr. 229), our investigation "has uncovered numerous instances in which apparently substantial amounts of proved reserves of natural gas have been discovered in the Federal Offshore areas and not produced." One company alone has received fourteen suspensions of production beyond the primary lease term, despite its reporting to the United States Geologic Survey of the discovery of hydrocarbons[7] "in paying quantities."

In sum, while it may be irrational to violate legal obligations and for that matter, to violate the antitrust laws, it cannot be assumed that for this reason such violations will not occur. I continue to hope that recalcitrant producers will agree voluntarily to return on their subpoenas, so that the Bureau's investigation into AGA reserve reporting may be concluded promptly.

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[5] An amount slightly in excess of 1% of total proved reserves reported for South Louisiana by the AGA for that year.

[6] I note that the following statement appears at page 8 of the FPC's *National Gas Reserves Study:* "The essential elements and techniques of the NGRS had been applied and tested previously by the FPC's Bureau of Natural Gas in the Uncommitted Gas Reserves Survey conducted as part of the South Louisiana Area Rate Proceedings."

[7] Natural gas was discovered in twelve of the fields; oil was discovered in two of the fields.

Very truly yours,

JAMES T. HALVERSON,
Director, Bureau of Competition.

Exhibit 5.—Response of W. O. Senter to Comments of James T. Halverson (Exhibit 4)

GAS SUPPLY COMMITTEE,
Washington, D.C., March 6, 1974.

Hon. PHILIP A. HART,
U.S. Senate, Old Senate Office Building,
Washington, D.C.

DEAR SENATOR HART: By letter addressed to me dated February 1, 1974. Mr. James T. Halverson, Director, Bureau of Competition, Federal Trade Commission, responded to certain comments which the Gas Supply Committee had filed with the Subcommittee on Antitrust and Monopoly by my letter dated July 16, 1973. In his letter, Mr. Halverson requested that you make such letter a part of the record of the Subcommittee on Antitrust and Monopoly hearings on competition in the natural gas industry. I make a similar request with respect to this letter.

I think a comparison of the two letters referred to will make clear that there is a basic and fundamental disagreement between the Gas Supply Committee and Mr. Halverson with respect to both the applicable facts and the conclusions to be drawn from those facts. I will not undertake to reiterate those facts or conclusions except in one respect.

In his letter at pages 4–9, Mr. Halverson criticizes the National Gas Survey and the National Gas Reserves Study conducted thereunder, particularly with respect to the statistical sampling procedures utilized. Mr. Halverson did not explain in his criticisms that the statistical procedures utilized were based upon the work and judgment of a statistical validation team comprised of a number of experts from both the academic world and sectors of government other than the Federal Power Commission. This statistical validation team was comprised of the following persons:

Daniel M. Bass, Chairman, Petroleum Engineering Department, Colorado School of Mines.

Basil P. Korin, Chairman, Department of Mathematics and Statistics, American University.

Lawrence R. Mangen, Federal Power Commission.

Daniel F. Merriam, Chairman, Department of Geology, Syracuse University.

Alfred T. Miesch, United States Geological Survey, Department of the Interior.

William L. Monroe, Federal Power Commission.

Howard W. Pifer III, Assistant Professor of Business Administration, Harvard Business School.

Paul J. Root, Federal Power Commission.

Wade P. Sewell, Federal Power Commission.

Harry B. Sheftel, Office of Management and Budget.

Joseph Waksberg, Bureau of the Census, Department of Commerce.

Marie D. Wann, Office of Management and Budget.

The report of this statistical validation team indicates that the participants were ". . . chosen because of their experience in the application of statistical principles to a variety of practical problems, especially in various disciplines of mineral science" (National Gas Reserves Study, Appendix VI. p. 1).

In his letter of February 1, 1974, Mr. Halverson stated that he was "highly concerned with the sampling procedures" which underlie the National Gas Reserves Study conclusions with respect to the statistical reliability of its estimates. Mr. Halverson apparently overlooked the statement of the statistical validation team that:

> "Additional sampling would reduce the standard error and, therefore, improve the statistical accuracy of the estimate. It is the judgment of the Statistical Validation Team, however, that additional sampling would have little practical effect on the reliability of this estimate of total reserves because of the problem of measurement error. That is to say, even if an independent estimate of gas reserves had been made for each field in the population, the value of total reserves determined would only be an estimate

of the 'true' value because of judgment inherent in estimating the reserves of individual gas fields." (National Gas Reserves Study, Appendix VI, p. 2)

On the basis of the foregoing, it would seem that Mr. Halverson's criticisms tend to be theoretical, whereas the statistical validation team is comprised of a number of qualified persons familiar with the various disciplines of mineral sciences. Weighted in this balance, the combined judgment of the team should be given utmost credence.

Yours very truly

W. O. SENTER.

Exhibit 6.—Response of Joseph C. Swidler, Chairman, State of New York Public Service Commission to Comments to W. O. Senter, Executive Vice President, Gas Supply Committee

PUBLIC SERVICE COMMISSION,
Albany, N.Y., August 30, 1973.

Hon. PHILIP A. HART,
U.S. Senate, Committee on the Judiciary, Subcommittee on Antitrust and Monopoly, Washington, D.C.

DEAR SENATOR HART: This is in response to your letter of July 18, 1973, asking for any comments I may have about the testimony of W. O. Senter, executive vice president of the Gas Supply Committee, in relation to the natural gas hearings before the Subcommittee on Antitrust and Monopoly of the Senate Committee on the Judiciary.

At pages 8–12 of his prepared testimony, Mr. Senter attempts to respond to my conclusion and recommendation that Federal regulation should be extended to cover so-called intrastate natural gas sales. Mr. Senter asserts that total deregulation, not extended regulation, is the proper course (1) because prices have been rising only gradually in the free market conditions of the intrastate markets and (2) because supply is responsive to price. With regard to recent price increases in the intrastate market, I should point out that intrastate buyers need bid only slightly more than interstate buyers are allowed to pay in order to capture new gas supplies. Any gradualism in the rise of intrastate prices must be attributed to the divided nature of the market, half regulated and half unregulated. If regulation is removed from interstate sales, field prices for natural gas will surely rise in both markets even faster than they have recently been rising.

With regard to supply, Mr. Senter asserts that supply is responsive to price but he does not attempt to prove it or to show how responsive supply may be. Where supplies are potentially unlimited in relation to demand, supply will, of course, respond to price increases. This is by no means true of natural gas supply. If, as appears to be the case, overall gas reserve additions are relatively unresponsive to price, existing gas consumers will find themselves bidding desperately against one another and against potential new gas consumers for limited available supplies.

Under those circumstances I fear the true meaning of Mr. Senter's statement that while "some trends to reduce industrial gas consumption in the producing States must be regarded as inevitable, the competitive free market is perfectly equipped to accomplish this transition over a period of time with the least economic disruption." (At mimeograph page 12). Where will the gas come from to accommodate this intrastate transition? Will there be enough gas left to meet the needs of captive, priority users in the interstate market? Mr. Senter does not say. While trying to extend the benefits of additional gas supplies for the advantage of intrastate industrial consumers, including the refinery loads of the oil companies themselves, Mr. Senter does not weigh the risk to the residential, institutional, commercial and industrial customers who depend upon the interstate market for their gas supplies.

Gas prices are now escalating rapidly to levels which hold out great incentives for production. Whatever additional supplies may result should be allocated fairly between the interstate and intrastate markets under Federal regulation of both interstate and intrastate sales at wholesale. The opposite course of deregulation of all sales would be disastrous to the interstate buyers dependent on a gas supply.

I am grateful for the opportunity you have accorded me to comment on Mr. Senter's statement.

Sincerely,

JOSEPH C. SWIDLER,
Chairman.

Senator HART. Now we again invite Dr. David Schwartz, assistant chief, Office of Economics, FPC, to come forward.

Let me state for the record that Dr. Schwartz received his B.A. from the University of Maryland and his Ph. D. from the University of Wisconsin. He served on the faculties of the Universities of Wisconsin and Maryland. He also had regulatory experience in the field of communications, as an economist and public utilities specialist with the Federal Communications Commission.

Dr. Schwartz previously appeared as a witness before this subcommittee testifying on the impact of technology on the industrial organization of the electric power industry. He also testified before the SEC and, in addition, has published in the area of public utility regulations and market study.

STATEMENT OF DR. DAVID SCHWARTZ, ASSISTANT CHIEF, OFFICE OF ECONOMICS, FEDERAL POWER COMMISSION

Dr. SCHWARTZ. I want to thank you for the opportunity of appearing here this afternoon. Initially, I want to cite a disclaimer at the bottom of my testimony, that is the views and opinions expressed in this statement are entirely personal and are submitted in an individual capacity. They do not necessarily reflect the views of the Federal Power Commission's Office of Economics.

The purpose of my testimony is to examine the general question of market structure in the gas producing industry and the specific questions concerning the nature and extent of the industry's organization as it relates to the question of workable competition.

In addition, I will review the various proposals to deregulate the price of natural gas at the wellhead and their potential impact on supply elicitation.

An evaluation of industry structure is relevant to deregulation advocacy and is intimately tied to the factors underlying the current unavailability of natural gas.

Lastly, a consideration of alternative means of increasing supplies and the role of regulation in the past, as well as in the future, in the most critical aspect of pricing and resource commitment, will be assessed.

Mr. CHUMBRIS. Will you bear with an interruption?

We had the Federal Power Commission here in their official capacity and you are speaking as an individual.

Would you mind telling us for the record whether we initiated your coming here or if you initiated the desire to speak before our subcommittee.

Senator HART. I am told we initiated it.

Dr. SCHWARTZ. I would never initiate a request of this kind. It is inconceivable. I received a letter from Chairman Hart asking if I would testify. I do not have that letter with me but I would be more than glad to provide it.

Senator HART. And my answer indicated that we did request you to be here.

Mr. CHUMBRIS. I thought it would be good to have it for the record. Yesterday we had the chairman and it ought to be a matter of record how you were brought into the hearing.

Dr. SCHWARTZ. Yes, I agree with you.

It is impossible to examine the question of deregulation without focusing on the issue of market structure. The critics of regulation contend that the shortage of natural gas is due to ill-conceived price regulation and characterize our present circumstances as a regulatory induced shortage.

If the FPC had not kept prices artificially low, the argument goes, thereby stimulating demand and discouraging exploration and development, we would not be in the predicament that exists today.

This contention has recently become somewhat tarnished in light of the fact that shortages exist in petroleum and petroleum products as well as natural gas. It is interesting to note that despite past prorationing, quota systems, and supports to maintain higher prices for crude oil and petroleum products, today we are faced with inadequate supplies of home heating oil and gasoline.

On the one hand, we have lower prices for natural gas because of the price constraints imposed by Federal regulation to prevent consumer exploitation; on the other hand, we have higher prices for crude oil and refined products because of Government sanctioned constraints, and shortages in both product areas.

Therefore, one can legitimately raise the question whether monopolistic constraints over supply availability imposed by the multiproduct firms are the basis for higher prices irrespective of regulatory surveillance.

In addition, because of interfuel substitutability, higher prices obtained by producers for natural gas can be leveraged to obtain higher prices for their oil products, and often coal as well, which are competing products at the point of final sale.

In short, the industry contention is that the regulated price is below the equilibrium market price and therefore a shortage of gas has resulted.

The critics argue that under a competitive market structure, without regulatory interference, prices would rise to the level required to bring forth the supplies needed to fulfill current demands for gas.

In this manner, assuming competitive markets, both the producer interests as well as the consumer interests and the broad public interest would be served by resource optimization.

It is true, of course, that competitive markets allow for equilibrium adjustments in which price is the lever which equates the quantity demanded to the quantity supplied.

In addition, both equities are served; that is, the producers cover their costs plus a competitive rate of return on investment and the consumers obtain the supplies at the lowest possible cost without any economic rents reflected in price.

While this theoretical analysis may have some abstract appeal, my main concern is that it is inappropriate as a description of the natural gas producing industry and totally devoid of the institutional realities that reflect a multitude of market imperfections.

The misspecification of the market structure can lead to erroneous conclusions with regard to both pricing and optimal levels of supply. The general confusion stems from equating contract prices as competitively determined prices.

In addition, such terms as "commodity value" or "market value" are used synonymously with the term "competitive prices." These catchall symbols do not distinguish a market price or commodity value determined in an imperfect market as distinct from prices determined under conditions of workable competition.

In monopolistic or administered markets, the contract or market price or commodity value will reflect conditions markedly different from prices that obtain under competitive market conditions.

This distinction is very fundamental because the gas producing industry postulates the reliance upon market prices and/or commodity value as a legitimization of its demand for deregulation, or in the alternative, as a regulatory standard.

Senator HART. Doctor, I think we should interrupt. There is a rollcall on the floor. I expect to be able to get back in about 10 minutes.

Dr. SCHWARTZ. All right.

[A brief recess was taken.]

Senator HART. Doctor, we interrupted you, as I recall, on page 5.

Dr. SCHWARTZ. That is correct.

The gas producing industry points to the price of substitute fuels, in the range of 52 cents to 82 cents, or supplemental sources of gas, $1 to $1.87, as reflecting the commodity value of wellhead gas in the lower 48 States.

The very premise of this position, that the so-called market value should determine the price of natural gas, is contrary to the basic concept of a competitive market price.

In a workable competitive market, it is the costs, plus a fair rate of return, associated with bringing the product to the market that determines the price anticipation of producers.

It is the costs associated with the production function, not the value in the end market to consumers vis-a-vis alternative fuel costs, which would be controlling under competitive market conditions.

To postulate the justification for natural gas prices on market factors as they relate to alternative fuel prices of supplemental gas prices, is a prima facie admission that there is market power which can exploit the differential between the costs of exploring, developing, and producing gas in the lower 48 States as distinct from the end-market value of the commodity.

One additional collateral point should be addressed concerning the difference between the regulated or cost-based price of gas and the price of alternative fuels to ultimate consumers.

The contention is made that either prices should be decontrolled so as to permit them to escalate to the approximate market value of alternative fuels, or that regulation should set prices at the crossover point.

In this way, the argument continues, this would discourage inferior uses of gas, such as for boiler fuel; motivate greater energy conservation; and, in an overall sense, curb the demand for gas.

Of course, this position totally ignores any discussion or justification of the windfall profits that will result.

The primary objective of regulation is to determine a price which will cover the resource cost of bringing energy to market, but there is no reason for an extra price increment on the basis of a demand constraint or conservation.

If supplies are inadequate, in the short run, we should rely upon direct controls such as the end-use priorities set by the FPC in its curtailment procedures. It is inconceivable that we should permit the private interests to perform the role of tax collectors and to assign priorities in the marketplace by imposing a price increment above that which would prevail under workable competition.

Another level of confusion that has been injected into the question of market structure concerns the contention that there is competition among producers in bidding for leases, offshore as well as onshore, that parallels price competition among sellers.

In addition, the argument is advanced that there is competition among pipelines for new gas supplies and that this reflects a significant competitive characteristic.

To postulate these arguments as in any way relevant to the question of producer competition in seller-buyer negotiations is completely spurious.

Elementary economics holds that it is the rivalry among sellers to bring their goods to market and the inability of any one seller or combination of sellers to influence price that is the traditional role of competitors.

This is the essential element that is lacking in producer market structure. As subsequent discussion will demonstrate, the use of market power by natural gas producers—of course, the exercise of this power is greatest at a time of shortage—precludes workable competition in this industry.

In addition, the lack of flexibility and incentive on the part of pipeline purchasers, who are also producers of gas, to bargain vigorously undermines any contention of meaningful competition.

This industry can best be characterized as a vertically integrated, bilateral oligopoly, that is a market with major imperfections in both buying and selling.

FPC jurisdiction over the producing sector has a long history which dates from the passage of the Natural Gas Act in 1938. Prior to the famous *Phillips* decision placing producers under regulation, a debate raged within the Commission as to the applicability and advisability of extending jurisdiction to the producing sector.

In the *Phillips* decision of 1954, the court stressed that the sales by independent producers in interstate commerce did not differ essentially from the sales made by producing affiliates of interstate pipelines, and therefore, in both cases, the rates charged may have a direct and substantial effect on the prices paid by ultimate consumers. Protection of consumers against exploitation at the hands of natural gas companies was the primary aim of the Natural Gas Act.

This decision, in effect, made the determination that competition in the producing sector was not adequate. There would, in fact, be no logical basis for regulating the industry if wellhead prices could be determined in a competitive milieu free of market constraints.

The fundamental issue of market structure was examined further in the original *Permian Basin* case wherein the producers advocated relying upon contract prices—for example, market price—as a basis for regulatory ceilings.

The Commission determined that while there were many producers selling gas to interstate pipelines both in Permian, as well as other areas, that the evidence did not permit the finding that competition among the sellers was in any way adequate to assure the public of just and reasonable prices.

The Commission further concluded that the supply of gas controlled by producers was so restricted in relation to demand that the ensuing economic power didn't permit for bargained prices between buyer and seller as a regulatory standard.

The Commission made the finding that there was no evidence of competition between producers to make new sales by offering lower prices, but to the contrary, the only competition was among pipelines to secure new supplies at ever-escalating prices.

The Commission concluded that the degree of competition by producers was inadequate to afford consumers the protection which was envisioned in the Natural Gas Act.

In the southern Louisiana area rate proceeding, the Commission again reviewed the industry contention that there was effective competition in the gas producing sector and again rejected this contention.

The Commission pointed to the stability of unregulated field prices through 1950 at levels not exceeding 9 cents per thousand cubic feet and the escalating prices in this area from 1951 to 1958 reaching a level of 24 cents per thousand cubic feet.

In the 2 years between 1951 and 1953 prices more than doubled. In this period the wholesale price index moved downward and therefore the rise cannot be accounted for by general inflation.

They concluded that the market imperfections challenged the producer contention of a free and competitive market and stressed that the serious imperfections precluded reliance upon market prices.

They stressed again that the ultimate consumer cannot be protected from unreasonable purchased gas costs if contract or market prices were relied upon because of the lack of arm's length bargaining existing in the producer market.

Finally, the Supreme Court in affirming the *Permian* decision highlighted the importance of costs as a regulatory criteria and it also noted the continued absence of effective competition:

> The field price of natural gas produced in the Permian Basin has in recent years steadily and significantly increased. These increases are in part the products of a relatively inelastic supply and steeply rising demand; but they are also symptomatic of the deficiencies of the market mechanism in the Permian Basin. Producers' contracts have in the past characteristically included indefinite escalation clauses. These clauses, in combination with the price leadership of a few large producers, and with the inability or unwillingness of interstate pipelines to bargain vigorously for reduced prices, have created circumstances in which price increases unconnected with changes in cost may readily be obtained.

The essence of the Commission and court determinations indicates that the evidence on market structure precludes consumer protection by exclusive reliance upon pipeline and distributor regulation at the Federal and local level without controlling the price charged by producers in the field.

Furthermore, it was determined that contractual relationships between buyer and seller did not reflect competitive bargaining; rather, they reflect strong incentives on the part of pipelines to effectively compete, particularly in periods of shortage, given the market power of producers.

The evidence indicated that the market strategy promulgated by producers reflected a community of interests in dealing with pipelines purchasers in which new reserves are offered as a package and not as individual supplies of gas by single sellers in competition with one another.

Frequently a producer in a field acted as operator for all producers and when new supplies were offered, they were usually provided under uniform terms and conditions, including price, so as to preclude independent initiative and aggressive price rivalry which are the hallmark of a competitive industry.

On the buyer side, the pipelines are at a great disadvantage because their need for assured supplies for many years in the future requires large scale purchasing to meet anticipated needs with fixed pipeline facilities tied to specific producing areas.

If they are to sustain their market growth and fulfill the objectives of the business enterprise as profit maximizers, new gas supplies under long term contracts are essential.

When a pipeline attempts to secure a supply from among the limited packages of new gas for its own system in competition with other pipelines purchasers, it is at a distinct disadvantage in trying to bargain with a producer, or combination of producers, in the areas where it may seek new gas supplies close to its system.

For any significant expansion of pipeline facilities, the pipeline must demonstrate the procurement of a 20-year supply, in most instances, in order to obtain new financing, achieve operating efficiencies, and sustain profit levels.

Although there are instances of long term contracts in other industries, the 20-year sales contract prevelant in the gas producing industry has the effect of concentrating the demand for a 20-year supply of gas at one time, that is, at the time of purchase.

This obviously results in a concentration of pipeline requirements and reflects an abnormal—in view of other industry practices—impact on limited supply availability.

In light of the fact that only a small fraction of gas produced in any 1 year becomes available as new reserves to the pipeline purchaser, and given the present requirements for new supplies, the pipelines are at a distinct disadvantage in price negotiations and anticipation of hard bargaining with producers is wholly illusionary.

In addition, the regulation of pipelines on a cost-of-service basis, in which the higher cost of purchased gas is included as an operating expense, mitigates against pipeline counterpressure with regard to producer demands.

An added disincentive is the now common automatic purchased gas adjustment provision that permits the pipeline to pass through any increases of purchased gas costs without delays.

Lastly, the fact that the major pipelines have producing affiliates which will benefit from higher wellhead prices provides another disincentive for the pipeline as a purchaser to act as a self-motivated competitor.

The position of the pipelines was clearly demonstrated in the recent second Permian Basin area rate case, AR–70–1.

The pipeline company group argued for de facto deregulation, contending that any rigid pricing method was futile and that establishing higher area ceilings was no solution because intrastate purchasers could always offer something greater than area ceilings.

The pipeline group contended that their hands should be untied and they should be permitted to compete by negotiating contracts for which they would obtain certificates free of constraints of Commission imposed prices.

This position speaks more eloquently than any theory of market structure as to any meaningful bargaining power of the pipelines as a counterforce to producer demands.

In light of these factors, one must conclude that very little motivation exists for pipelines to drive a hard bargain and that the relative strength of producers acting in combination is decidedly enhanced.

In the various area rate proceedings, the gas-producing industry introduced a plethora of evidence to support the contention that effective competition should be relied upon as a regulatory guide and asserted that contract prices should be used to support this position related to: (1) concentration ratios, (2) leadership turnover, and (3) conditions of entry.

Of major importance is the reliance of the producers on concentration ratios predicated upon production, volumes sold, in any 1 year, to support the position that the industry was not significantly concentrated, particularly in contrast to other industrial sectors.

In this regard, the latest information indicates that 22 domestic producers furnished the interstate pipelines with 71 percent of the gas supplied in 1971.

While this appears to be a relatively low measure of concentration, it is totally inappropriate because the great bulk of the gas produced in any 1 year was committed to contract many years in the past and it is not indicative of new supplies.

The only relevant concentration measure pertains to uncommitted reserves. Unlike other industries, production in the natural gas industry does not equate to new supply availability.

It is this information, that is uncommitted reserves over an extended period of time, which is the valid measure of concentration. This is the very information that the industry has refused to provide—except on two occasions, December 31, 1971, and June 30, 1972—for special purposes and in aggregate form, so that a valid assessment can be made as to concentration and control over new supplies.

In the latest producer proceeding involving Belco Petroleum, which was the first formal evidentiary hearing under the optional pricing procedure, the FPC staff used new sales excluding et al. contracts as a proxy for uncommitted reserves to measure four-firm and eight-firm concentration.

To the extent that producers were additionally involved in et al. sales, the concentration ratios would have been higher than reflected in the staff exhibit.

The conclusion reached, contained in the initial staff brief, page 34, indicates that,

> * * * as was shown in exhibit 33 the natural gas producing industry is highly concentrated, with the top 4 firms often controlling 50 percent or more of the relevant market and the top 8 accounting for 70 to 80 percent.

Additionally, the staff brief pointed out that the validity of simply comparing concentration ratios with other manufacturing industries to determine potential competitiveness is exaggerated because gas is not a durable goods and gas demands are essentially nonpostponable.

Because there are no secondhand supplies available, producers can keep finite depletable resources underground, and therefore have the opportunity for price speculation by withholding gas supplies to force prices upward.

Another important area in which evidence was introduced by producers concerns the contention that there is turnover among the top firms in the industry, and this presumably implies that if old leaders fall from the top 10 while new ones rise, there is a degree of market competition reflected in this rotation.

In the Belco proceeding, the evidence indicated that the top eight gas producers in 1970 were also among the top nine in 1957. Moreover, the two firms that attained the ninth and tenth places by 1970 did so not through competitive growth but through merger.

It appears that to postulate turnover as meaningful evidence of effective competition in the gas-producing industry is an unsupportable assertion. All the indications are that the major firms have been continually dominant over a long period of time and that significant entry barriers exist that would prevent a breakthrough within the ranks of the majors.

The final criteria to establish the predicate for a competitive structure is the contention by the producers that there are no significant entry barriers in the industry.

This assertion fails to perceive the fact that small sellers are unable to enter prolific offshore areas independently or at all because of significant large investment requirements. Their entry cannot be characterized as inducing competitive interplay when they depend upon farm outs by large producers or combine with large producers in joint ventures that reflect a coalescence of their interests.

New entrants possess no market power which can offset the dominance by the majors and rarely can the smaller firms influence supply or price in an independent manner.

Here again, a comparison with manufacturing industries would lead to erroneous conclusions with regard to the significance of new entry in the gas-producing industry.

Finally, the relevance of market structure and the appropriate regulatory standards were recently articulated in the above-cited *Belco* proceeding. The FPC staff unequivocally took the position that due to the absence of effective competition in the natural gas industry, cost-based price regulation was the only valid regulatory criteria.

A welter of evidence introduced for the first time provided a new dimension to market structure in the gas-producing industry. The inescapable conclusion was: "The petroleum industry is not structured so as to render competition workable." (Staff reply brief, p. 35.)

In light of this conclusion, it is obvious that the reliance upon market determined prices would reflect monopolistic rather than competitive conditions.

The extensive evidence on the nature of the anticompetitive structural features of the petroleum industry illustrated the manner in which major firms are extensively interlocked with each other through an all-pervasive web of partnerships and joint ventures in all stages of finding and producing gas.

Since the fundamental and indisputable requirement for a competitive market is a diverse group of independent sellers, the producer contention that the industry is workably competitive and that market determined prices are an adequate regulatory standard is unsupportable.

The evidence concerning mergers among large firms in the petroleum industry indicated that there were over 50 major mergers during the 1960's alone.

In addition to the elimination of substantial numbers of independent producers, the turnover among the top 10 as discussed previously indicates that dominance of the large producers.

The most significant institutional characteristics are the interlocking relationships in joint bidding for offshore Federal leases, Louisiana State leases, joint production from offshore leases, joint ownership of foreign subsidiaries, joint ownership of oil pipelines, and unitization agreements in the Permian Basin, Tex., all pointing to the community of interests that prevails in the producer market structure.

The inescapable conclusion in evaluating the evidence in prior area rate cases and the new evidence on joint ventures and interlocking relationships suubmitted in the *Belco* proceeding is an awareness of the formidable market imperfections and of the absence of workable competition in the gas producing industry.

The question of available supplies and the causal factors concerning our present needs to curtail deliveries of natural gas is an emotionally charged and controversial subject. In order to objectify the relevant factors, I think it is important to separate the various components of the supply question as it relates to the availability of natural gas.

First, there is no question that the domestic resource base in the United States is substantial and there is no physical shortage of the potential natural gas supply. The estimates of our potential gas supply range from a low of 1,100 trillion cubic feet by the Potential Gas Committee to a high of 2,100 trillion cubic feet by the U.S. Geological Survey and beyond this level assuming technological improvements.

This resource base should be compared with the current production of 22.4 trillion cubic feet as a gage of potential gas supply availability.

It has been estimated that if we assumed an annual growth rate of 1.4 percent, our potentially recoverable gas reserves would be adequate for 32 years, using the Potential Gas Committee forecast, or for 65 years, using the U.S. Geological Survey estimates. Excluding Alaska, proved reserves at the end of 1972—that is, the actual reserves available for production in an inventory sense—were 234.6 trillion cubic feet; and including Alaska, 266.1 trillion cubic feet.

With regard to the adequacy of the resource base, even the producer industry agrees, the domestic natural gas potential can provide significant levels of new supplies.

Of course, the industry argues that price has been inadequate to bring forth the potential supplies that exist in a resource sense. This is the key area of controversy.

Has the industry failed to perform despite the regulatory determination of area rates that cover all costs, including dry hole, and under recent decisions provide for a 15-percent rate of return; alternatively, is the industry correct in its contention that price levels are too low, discouraging exploration and development?

Before examining the questions concerning supply-price elicitation in a regulatory context, it is important to realize that there are certain external factors which played an important part in our current supply problem.

First, the early 1960's market forecasts by the industry indicated a very significant drop in the growth rate of natural gas sales by the end of the 1960's. Given the fact that there was approximately a 20-year supply on hand in the early 1960's, this quite naturally discouraged any significant exploratory effort.

Unaware of the prospective new demands for gas resulting from air pollution abatement, the industry projected future growth rates that were approximately half the level prevailing at that time.

Secondly, there was only one Federal wildcat offshore lease sale between May 1968 and September 1972 by the Department of the Interior.

Thirdly, given the limited amount of domestic oil exploration and development in the sixties, there was a marked drop in drilling which affected natural gas reserves found because it is conservatively estimated that 25 percent to 40 percent of natural gas is discovered in the search for oil.

Lastly, there were many opportunities available for international companies to channel their capital to other areas such as the Middle East, Alaska, and the North Sea, thereby reducing exploratory and developmental activity in the Southwestern United States.

It is impossible to be sanguine about the potential of using price to constrain the demands for gas. Particularly in the short run, demand is relatively inelastic and the price of alternative fuels is significantly higher than natural gas.

In addition, any increase in the wellhead price when averaged with the lower rolled-in price has an impact on consumers in the end market. Also, because consumers have incurred substantial sunk costs in gas burning equipment, they are unlikely to shift to other fuels if this entails any significant capital costs for new equipment. The impact of environmental requirements has heightened the need for clean burning fuels, creating considerable pressure on industrial users to demand natural gas.

Lastly, the imperfections in fuel markets generally make it possible for an increase in the price of gas to trigger an increase in the price of other fuels, particularly when these firms market petroleum products as well as coal.

To return to a consideration of the supply question, an examination of table I shows the drop in total wells drilled, for all hydrocarbons. From 1963 to 1972, there was a decline of approximately 35 percent. The average of the earlier 5-year period, 1963–67, in contrast to the latest 5 years, 1968–72, indicates a decline of 26.6 percent.

The downturn in gas and gas-condensate well drilling was not as great as in total wells drilled. It is interesting to note that the decline in developmental gas and gas-condensate wells and footage drilled in the latter 5-year period, 1968–72, from the former 5-year period, 1963–67, was 15.8 percent and 12.2 percent, respectively.

This is greater than the relative decline in explanatory wells and footage drilled in the same periods, 11.2 percent and 6.6 percent, respectively. This suggests that the industry continued to explore for new gas supplies but deemphasized development and potential commitment of new supplies to meet market demands. It should be noted that 1972 was a turnaround year in gas well drilling, reflecting an increase in both exploratory and developmental wells and footage drilled over 1971. There is speculation as to whether this marked increase in drilling is due to the prospects for deregulation or for higher prices generally.

Senator HART. Doctor, I apologize, but there is another vote on the floor. We will recess for 10 minutes.

[A brief recess was taken.]

Senator HART. You were about to continue on a table that we discussed in part with the chairman of the Commission yesterday.

Dr. SCHWARTZ. That is right, Mr. Chairman.

The historical relationship of gas production and new additions of reserves is reected in table II. Of significance is the marked increase in production, or demands for gas, in contrast to new reserve additions. The average of the earlier 5-year period, 1965–67, indicated production of 16.4 Tcf and new additions totalling 19.9 Tcf. [trillion cubic feet].

In this 5-year period the weighted-average initial contract price was 17.3 cents and the weighted-average new gas ceiling price 18.1 cents. It is interesting to note that in the 1963–67 period new gas found exceeded gas produced and that there were substantial new commitments in the 18–21 Tcf range with initial contract prices in the 16–18-cent range and approximately an 18-cent new area ceiling price.

There was no supply deficiency in the earlier 5-year period. Allowing for lags and inationary effects, we can still discern that significantly higher quantities of new additions were being brought forth at considerably lower prices than in the latter 5-year period, 1968–72.

In fact, net production, demand, increased to over 21 Tcf on the average, while new additions shrunk to approximately one-half of the average new additions in the earlier 5-year period.

That is, new additions averaged about 10 Tcf in 1968–72. The weighted-average initial contract price ranged between 19 and 30 cents during this period and averaged 23.1 cents in the latter 5 years.

The weighted-average ceiling new-gas price ranged between 17.6 and 25 cents and averaged 20.6 cents and averaged 20.6 in the latter 5-year period.

A comparison of the average 5-year earlier period with the 1968–72 5-year average indicates net production going up by more than 29 percent; total reserve additions going down by approximately 50 percent in response to a 33.5-percent increase in weighted-average initial contract prices and 13.8-percent weighted-average new-gas ceiling prices.

What appears to be an inverse relationship between price and new supplies—what economists would call negative elasticity—is the puzzling question that emerges from these figures. The normal expectancy would be for supply to increase as price increases and even if the elasticity of supply response is less than the price increases—that is, supply is relatively inelastic—we would still expect something other than negative elasticity.

I think the answer to this apparent contradiction lies elsewhere. With the anticipation of significant price increases that have existed since 1968, one would expect lower exploratory and developmental activity.

Put another way, it is more profitable to keep gas in the ground rather than to explore, develop, and produce new supplies for commitment to contract as long as the expected present value of future returns is greater than current rates of return that could be earned at existing price levels.

In other words, producers would prefer to speculate that price increases in the future will result in higher returns than commitment of gas at current price levels.

Senator HART. Doctor, let me interrupt. Yesterday we referred to this table when we were discussing the subject matter with Chairman Nassikas. I sort of backed away, as I recall it, because we were unsure precisely how you were defining these things. But it appears, and I now ask you if this is correct and, if so, explain the basis for it, that with the price increase of more than 33 percent——

Dr. SCHWARTZ. That is an average, Mr. Chairman.

Senator HART. Yes, it is an average rate of 33 percent. There was a decline in total reserve additions of almost 50 percent.

Dr. SCHWARTZ. That is correct.

Senator HART. In the second period of comparison?

Dr. SCHWARTZ. That is correct.

Senator HART. Tell me why it is correct.

Dr. SCHWARTZ. I do so later on in my testimony. I will be more than glad to articulate freely.

Senator HART. Well, if you do respond to this, we need it in the record. We were unsure of this.

Dr. SCHWARTZ. Obviously, if you compare the two 5-year averages, the increase in price is weighted-average increase in prices—that is the prices paid by producers to pipelines for the sale by producers to pipelines.

If you take the initial contract price comparing the two 5-year periods, there was an increase in price. Actually, in the last 5 years, if you take the average initial contract price, the weighted average (that is weighted with volumes), we are not adding up a simple arithmetic average, but the contracts that come in with the volumes associated with those contracts, and we are getting a weighted-average contract price.

If you take the weighted price in 1968, it was 19 cents. In 1972 it was 30.4 cents, which is approximately a 50-percent increase in the last 5 years of weighted-average initial contract prices. In that period, the new reserve additions ranged between 9.4 and 12, and averaged about 10.

No, it would range between 8.3, as you see in column 3 of table 2, and averaged 10. This is an empirical fact taken from the records of the Federal Power Commission: We had a 50-percent increase in the initial average contract price and a decline of approximately 50 percent of new reserve additions.

[Table 2 referred to appears at the end of Dr. Schwartz' statement.]

Senator HART. Until I backed off yesterday, I was trying to get an answer to the question of how you can suggest a price increase increases the reserves. Here it appears that you are losing ground rapidly as you increase price, but now you tell me what is wrong with that, if anything.

Dr. SCHWARTZ. It is one thing to cite what the factual information is. It is another thing to determine what the causal factors are. The industry says, the price is inadequate and they just didn't produce. I say that you will not produce as long as we have anticipations of higher prices in the future. It is illogical for a firm and any management of a firm, from a profit maximizer standpoint, to produce gas at 26 cents, which was the area ceiling established in the *Southern Louisiana* case in July 1971, when, in fact, the prospects are for 45 cents.

To commit your gas at 26 cents is an imprudent decision on the part of management.

As long as we have price expectations which will exceed the potential returns that can be earned now—in other words, if future returns are greater than present returns anticipated—then you will not develop and commit gas.

I believe this point is made on the bottom of page—well, I have my summary here. I have it on 21 and why don't I just jump to that point in order to summarize my views, if that is appropriate?

Mr. Chumbris. To put this in focus, the chairman's question yesterday came at a point where Chairman Nassikas was giving a year-by-year price of natural gas, starting, I believe, with 1963–64 up to 1968. That is when the chairman saw this chart and asked the chairman to explain the variance between your chart and his testimony.

You were taking it as 1963–67 and 1968–72, while Nassikas was taking it year by year.

Dr. Schwartz. The basic difference, I believe, Mr. Chumbris——

Mr. Chumbris. I was merely focusing on how the question came up so that if anyone wanted to read the record, he would not have to read where Nassikas was getting his figures from and how your chart came into the picture. I was trying to put together Nassikas' reply and your reply to the Chairman's question, so that if there is an issue to be resolved, we can resolve it.

Dr. Schwartz. I think that is a very correct clarification of the sequence of events and I think there is one added factor you should have in order to further clarify: Chairman Nassikas was dealing with the average price paid by pipelines for flowing gas and that price is entirely different, because that is a rolled-in price of all former contracts, earlier contracts. Then you average any new commitments at higher prices.

I am dealing with the weighted-average initial contract prices and on contracts that are made in that year. I say that is the better measure of supply elicitation because that is the price the producer is getting under the contract that he consummates with the pipeline. This is a better measure, in fact, of producers' anticipations of what supply elicitation or new supplies he wishes to commit in terms of the future.

Now, there is another column that deals with weighted-average rate ceilings established by the Commission. Of course, those are less than contract prices and there is a lot of controversy as to what price signal does the producer respond to. Does he respond to the contract prices he enters into? Does this become his anticipation in terms of new supply elicitation or does he respond to area ceilings?

That is why I gave you both, because in many instances I think it will be one or the other or perhaps both, depending upon the management.

I hope that is clarifying, Mr. Chairman.

Senator Hart. It is.

Dr. SCHWARTZ. Table III provides a detailing of weighted-average initial contract prices for the last 3 years for the major producing areas.

With a price increase of approximately 50 percent, 20.8 to 30.4 cents in the latest 3-year period, allowing for lags in commitment, there is pessimism as to new additions of reserves increasing appreciably and more curtailments are still projected by the industry.

Lastly, table IV depicts the response to the offshore Louisiana lease sales in 1962 and 1970. Of the 401 leases sold in 1962, 143—35.7 percent—are currently producing, but 55—13.7 percent—are producing shut-in.

[The tables referred to appear at the end of Dr. Schwartz' statement.]

Dr. SCHWARTZ. This is a very high percentage of shut-in tracts for such a long time span. In fact, the producing-shut-in leases as a percent of all producing leases is 27.8 percent. On the basis of the total bonuses paid—$445 million—the "producing-shut-in category is $56.8 million—12.8 percent.

It is interesting to note that the Belco Petroleum lease, the basis for the original optional price hearing referred to earlier, was first obtained by Chevron in the 1962 lease sale and made available to Belco on a farm-out arrangement in April 1971. Finally, sometime this year gas will flow to the interstate market.

Of the 117 leases sold in the 1970 offshore lease sale in the Federal domain only 9—7.7 percent—are currently producing and 38—32.5 percent—are classified as producing shut-in.

It should be noted that 70 leases—59.8 percent—are not classified and, therefore, do not fall into either category. Of the total bonuses paid—$845.9 million—the producing-shut-in category accounts for $346.1 million—40.9 percent—of total bonuses.

Here again, a very large proportion of the leases as well as the bonuses paid are reflected in the producing-shut-in category. Taken together, it would appear that there have been and are anticipations on the part of producers which have led to significant postponement of commitment from the offshore area.

There are a number of variables that impinge on any determination of consumer costs associated with changes in price.

The most significant aspect is to determine what incremental supplies will result from varying prices. This is the very information that the gas producing industry contends they cannot provide.

It is the industry position that supply-price elasticities cannot be quantified, and that we must accept on faith that higher prices will bring more gas than lower prices. Yet an examination of table II indicates that new reserve additions were appreciably lower in the recent 10-year period at higher prices than were committed at lower prices in the earlier period.

It is difficult to understand why we cannot obtain some indication of supply-price elasticity. There is a logical inconsistency between contending that new supplies are lagging because prices are inadequate, and the failure to objectivity the costs associated with the claimed required price.

Undoubtedly, producers are aware of the costs incurred in the past and they can estimate future costs associated with a project.

It is the estimate of future costs that should translate into supply elasticities at varying price levels. It is the incremental cost of bringing forth new supplies of gas that is relevant for the firm in an operational context.

This is the motivating factor behind the regulatory determination of a new gas price equating incremental costs plus fair rate of return which would conform to the concept of an equilibrium price in a competitive market.

The importance of determining the supply-price elasticity is evident by examining table 5. While most economists agree that supply is relatively inelastic in the short run, the main uncertainty is the supply-price elasticity in the long run.

[The table referred to appears at the end of Dr. Schwartz' testimony.]

Dr. SCHWARTZ. If we assume that the current commitments of new additions of 10 trillion cubic feet will be obtained with a 25-cent-per thousand cubic feet price and if we increase the price to 37.5 cents per thousand cubic feet with a 0.1 elasticity, the supply increase would be one-half of a trillion cubic feet.

The resulting cost of the supply increment will equate to $2.87 per thousand cubic feet. What this means is that the consumer would be better off if the price were kept at 25 cents per thousand cubic feet and supplements or alternative fuels were purchased to satisfy the incremental need of ½ trillion cubic feet as long as they could be obtained for something less than the equivalent of $2.87 per thousand cubic feet, assuming a supply-price elasticity of 0.5. And, if you recall, this was the range that Chairman Nassikas felt was appropriate. There was some uncertainty among the academics and others as to what it was in the gas producing industry. If we assume the top of the range of 0.5, an increase in price of 37.5 percent per thousand cubic feet will result in a supply increase of 2.5 trillion cubic feet.

The cost of the increment will be 87 cents per thousand cubic feet. Here again, if we can obtain equivalent supplies for alternative fuels at anything less than 87 cents, the consumer would be better off by keeping the price at 25 cents per thousand cubic feet than permitting the price to rise to 37.5 cents.

The table also illustrates the supply increases when the price is increased from 25 to 50 cents per thousand cubic feet with the cost of increments varying from $3 at the lowest elasticity measure to $1 per thousand cubic feet assuming the highest price elasticity, depending upon the supply elasticities from 0.1 to 0.5.

This is another illustration that the consumer would be better off by holding price to 25 cents per thousand cubic feet and purchasing alternatives at anything less than $3 in the case of a 0.1 elasticity, in contrast to a 0.5 elasticity reflecting incremental costs of supply of $1.

The same analytical framework applies to the lower portion of table 5. Assuming that 10 trillion cubic feet of new additions will be committed at 35 cents per thousand cubic feet, a price increase to 45.5 cents per thousand cubic feet with an elasticity of 0.1 results in a cost of increments which would be $1.15 per thousand cubic feet.

It is obvious that if new supplies could be brought on at something less than $3.95 if elasticity were 0.1 or $1.15 if elasticity were 0.5 that consumers would be better off if the price were held to 35 cents and alternative sources of fuels could be obtained at lower consumer costs.

Lastly, there is an illustration of increasing the price from 35 cents to 59.5 cents per thousand cubic feet. With an elasticity of 0.1, the cost of incremental supplies would be $4.09. With an elasticity of 0.5, it would be $1.29 per thousand cubic feet.

The example illustrates, again, the reference points where consumer costs would be minimized.

To measure the potential dollar impact on consumer costs a number of assumptions are necessary regarding the base price level from which gas purchased from domestic producers would vary.

For example, in 1972, producers received $4.5 billion or a little more than 20 cents per thousand cubic feet for total natural gas produced.

If all gas were repriced to reflect the current price levels based on the commodity value premise of producers, this would equate to double or triple the average price paid in 1972, and result in an increase to consumers ranging between $4.5 to $9 billion annually.

A conservative procedure for determining potential consumer impact is to ascertain the effect of contract expiration.

Table 6 shows by year of expiration, 1973 through 1980, the number of contracts, the volumes sold, and the revenues collected. For the 623 contracts expiring in 1973, the average revenue received for all producing areas is 17.89 cents per thousand cubic feet. If we assume that these prices will escalate to 35 cents—a modest assumption considering recent interstate or intrastate contracts for gas—then the incremental impact on consumers will be over $192 million.

If we assume that the price will escalate to 45 cents for these volumes, the additional revenues received will be over $300 million. If we assume 60 cents will be the price obtained by producers—and the industry is looking for more than 60 cents, because one of the producers asked for a price between 75 and 80 cents—the additional revenues received will be $472 million.

By the end of 1974, the contracts which will have expired in 1973 and 1974, and the volumes which were sold previously at 17.89 cents and 18.22 cents, respectively, if sold at 35 cents would cumulatively result in revenues of $410 million; if sold at 45 cents, would result in cumulative revenues of $650 million; and at 60 cents, the additional revenues would be over $1 billion.

[Table 6 appears at the end of Dr. Schwartz' testimony.]

Mr. Chumbris. If you can stand an interjection at this point, let's look at the other side of the coin of not having sufficient natural gas. Let's assume that we stay at 20 cents at the wellhead for 1,000 cubic feet which was placed in the record by several of the witnesses and you only have so much natural gas to use and, therefore, you have to use a substitute. If you use oil in place of natural gas, you are paying 60 cents for a comparable amount. If you use synthetic natural gas or liquified natural gas, it is running from $1.25 to $1.50 per 1,000 cubic feet.

As a matter of fact, the Chairman used as an example yesterday a Connecticut contract for LNG that is going for $1.80.

Now, if these are true, then the consumer who is under this 20-cent contract is in pretty good shape. But the Connecticut consumer who needs that synthetic or liquified natural gas and must pay $1.80 is getting beaten over the head to protect someone in Kansas City who is lucky enough to receive it for 20 cents.

I am just throwing that out as one of the problems that has been raised by some of the witnesses. How do you resolve this situation in a manner which is fair to all the people?

Dr. SCHWARTZ. Very simply. You are talking about the increments of supply of $1.80 or $1.20 as compared to a rolled-in price of 20 cents.

The assumption you are making——

Mr. CHUMBRIS. I am not making an assumption.

Dr. SCHWARTZ. In your hypothetical, there is an assumption that you will discriminate between certain consumers who are getting the gas at 20 cents and others who will be paying more. This is not necessarily so. All the pipeline has to do is roll-in the cost of the supplemental supplies of $1.20 or whatever the charge is and charges the average price to the distributor company and the distributor company charges the average price to all consumers so there is no discrimination between new consumers and old consumers under this procedure.

This rolled-in price is generally used throughout the industry. They do not have as yet the so-called incremental pricing tariffs which are implicit in the example that you gave.

Let me try to move on, Mr. Chairman; I know the time is fleeting.

The cumulative annual effect of contracts of major producers, which do not cover all sales, expiring by their own terms, will result in 1980 in additional revenues, assuming continued gas flows, varying from approximately $3 billion at the 35-cent price to $7.6 billion at the 60-cent price.

A corollary piece of information relating to table 6 are the sales by the top five producers made under contracts expiring in the 1973–80 period. The companion table 7, consisting of four pages, indicates that a significant proportion of the total volumes under contract expiring in 1973–80 can be attributed to the top five producers.

[The tables referred to appear at the end of Dr. Schwartz' testimony.]

Dr. SCHWARTZ. This varies from a low of 56.6 percent in southern Louisiana to a high of 99.6 in the Permian Basin.

A fundamental point of departure for measuring the impact on consumers of potential price increases is the distinction between flowing gas and new gas.

For example, the latest information indicates that the average cost of natural gas paid by interstate pipelines to domestic producers is 21.73 cents per thousand cubic feet.

If average flowing gas rates were to increase to 30 cents per thousand cubic feet, and the intrastate impact equated to the interstate, then based upon last year's volumes, the additional revenues received by domestic producers would be approximately $2 billion annually.

In light of the price assumptions and various definitional distinctions, this probably represents a very conservative figure.

For example, there are a number of proposals to deregulate new gas prices but to continue the regulation of gas flowing under contracts. If the definition of new gas in the administration's bill is used, as will be discussed subsequently, this will permit for a significant redefinition of flowing gas as new gas.

The critical element in measuring the impact on consumers is the awareness of the weak bargaining position of the pipelines.

Undoubtedly, there will be great pressure exerted by producers on pipelines to renegotiate contracts. The producers argue that if new supplies are to be obtained at significantly higher prices—and physically, there is no distinction between old and new gas—then the price for flowing gas should reflect the current market value of gas as a commodity.

Of course, this reliance upon the physical similarity thesis by gas producers completely ignores the economic considerations relating to the significantly lower costs associated with finding gas in the past in contrast to current costs.

The old gas is now flowing; and the costs were incurred years ago under different prices; the variable costs, the production costs, are relatively small compared to flowing gas; and any inflationary impact is relatively minor.

With a new gas price, obviously, you have to foresee the commitments of new investment, and it has to be premised upon the marginal or incremental costs.

To reprice old gas, I think, is a great inequity to consumers and provides no rationale whatsoever.

I indicate here that there is a great danger that pipelines will acquiesce.

The acquiescence of pipelines to renegotiate old contracts is demonstrated in the recent agreement between Gulf Oil Corp. and Texas Eastern Transmission Corp., now before the Commission in docket No. CI64–26, to alter the terms of the 1963 contract in which they agreed to a price increase from 19 cents to 26 cents per M ft^3 (initially, southern Louisiana), and subsequently amended the agreement to provide for a price based upon the rate obtained by other producers under the optional pricing procedure.

If the new agreement is approved the FPC staff estimates the potential additional cost to consumers for incremental new field volumes of gas at an initial price of 45 cents plus escalations of approximately $600 million.

One of the reasons given by Gulf for its inability to continue making deliveries at the old contract price was a deficiency of 1.5 trillion cubic feet of gas originally estimated and committed as reserves under a warranty agreement in the initial contract. They had originally estimated 2.5 T ft^3 in the offshore area, but in 1968 reestimated that only 1 T ft^3 of reserves underlie this acreage.

As part of the arrangement, Gulf agreed to commit all future gas discoveries to Texas Eastern, within reach of its pipeline, and to accelerate exploratory and developmental expenditures. Gulf justified the 26-cent contract price on the basis that this would be the price that they would have to pay the SLAM combine (Signal Oil, Louisiana Land & Exploration, Amerada-Hess, and Marathon Oil) for supplies to make up part of the contract deficiencies.

It is interesting to note that in the December 1972 offshore Louisiana Federal domain lease sale, Texas Eastern was a member of the SLAM group in 25 bids for offshore acreage. In no instance did Texas Eastern bid independently, but in every instance it bid as a member of SLAM.

This will cost the consumers $600 million alone for these volumes because the commitments under this contract were originally 2.5 trillion under the warranty contract and they came up with a shortage of 1.5 trillion or a 60-percent estimating error. It was on the basis of this shortage that Gulf and Texas Eastern said they would try to renegotiate and see if they could provide the gas from other sources and they would have to pay more.

To summarize, the measurement of the impact on consumers of potential price proposals relating to natural gas must be seen in the light of the producer pressure to raise the price of flowing gas, as well as obtaining higher prices than current area ceilings for new supplies.

In addition, the ability of the pipelines to withstand producer demands for higher prices is significantly vitiated because of their self-interest as producers of gas.

Lastly, in a period of short supply, the pipelines will most likely acquiesce to contract renegotiation on flowing gas because this may be the only way to obtain new supplies.

The administration's bill, submitted on April 18, 1973, by Acting Secretary of the Interior John Whitaker, has been formally introduced in the House as H.R. 7507.

This bill, while purporting to exempt new gas from FPC regulation, in fact provides a number of options that can significantly affect the repricing of gas presently under contract.

While it may appear esoteric to pursue definitional distinctions, it is critical for understanding the implications of the bill.

First, the proposed legislation provides that gas will be exempt from regulation if it is dedicated for the first time to interstate commerce, or rededicated upon expiration of an existing contract on or after April 15, 1973, or produced from wells commenced on or after the aforementioned date.

One of the detriments of the wells-commenced standard, while superfically appearing to be new gas, in fact may lead to resource waste because of the unnecessary drilling that may occur in order to qualify for the deregulated price.

In addition, it may encourage producers to divert production from existing wells to new wells in order to tap the same reservoir. The wells-commenced approach is particularly inappropriate with regard to developmental wells which can be easily drilled with a minimum of economic cost.

In order to discourage the unnecessary drilling of new wells, as well as the withholding of gas to obtain higher prices by qualifying for the new gas price, we should use the date of new discoveries as the guideline.

Another basic provision of the bill concerns the exemption from regulation of renegotiated contracts. The earlier discussion indicated the lack of incentive or bargaining power on the part of pipelines and we can anticipate large scale renegotiation of contracts whose present terms would permit continued regulation under the old gas price.

Here again, it is necessary to insist upon regulatory constraints until the full term of the contract has expired.

The proposed legislation provides for surveillance by the Secretary of the Interior over the movement of prices once they are decontrolled.

It gives him the authority for a 3-year period after the enactment of the legislation to reimpose ceilings if he deems it necessary but specifies that he is to do so only after considering: (1) The current and projected price of other fuels; (2) the premium nature of natural gas and its environmental superiority; (3) current and projected prices for importation of liquefied natural gas and the manufacture of synthetic gaseous fuels; and last, (4) the adequacy of these prices to provide necessary incentive for exploration and production of domestic reserves.

Placing this responsibility in the Department of the Interior seems particularly inappropriate, in light of the fact that the Federal Power Commission has the background, staff, and expertise to monitor a system of contract review.

The Commission currently obtains contract information from pipelines concerning the prices paid producers.

More importantly, the proposal for a 3-year review period, instead of indefinite surveillance, could discourage the immediate commitment of new reserves because of the benefit of postponement and the avoidance of public scrutiny after the period has elapsed.

The proposed legislation also extends FPC jurisdiction to direct sales by pipelines to ultimate consumers. This provision was included with the suggestion that this would permit the Commission to adjust industrial rates where necessary to reflect the value of this premium fuel.

In other words, it is anticipated that the Commission could allocate a higher proportion of the cost to industrial users rather than residential consumers.

While this may have superficial appeal, we should not forget that industrial users will pass on a substantial portion of these higher production costs to consumers in the form of higher prices wherever it is feasible.

Finally, Congress should couple the consideration of any deregulation bill with a review of specific antitrust action that may be required because of the structural imperfections of the industry. Specifically, the Justice Department should be instructed to undertake a thorough and comprehensive investigation of the joint ventures and other interlocking relationships now prevalent in the petroleum industry to determine whether, in fact, the blockage of effective competition requires remedial action.

In addition, the Justice Department should more carefully scrutinize any proposed merger or acquisititon in the future, not only of petroleum companies, but of firms in other energy areas such as coal and uranium.

One particular area which should be considered by the Justice Department involves the practice of joint bidding for Federal leases and the potential anticompetitive features of these joint ventures.

A companion review could be implemented by the Federal Trade Commission by broadening its current investigation of the petroleum industry to consider the market structure question.

Undoubtedly, the special expertise of the Federal Trade Commission staff in the area of industrial organization, and their immediate awareness of problems unique to the petroleum industry generally, would enable them to review the gas producing sector with a high level of professional skill.

Senator HART. I am afraid we will have to suspend again for another vote.

[A brief recess was taken.]

Senator HART. All right, Doctor.

Dr. SCHWARTZ. I will very quickly conclude, Mr. Chairman, by considering the public interest alternatives.

At the outset it is important to stress that the solution of our supply inadequacy must be seen in the context of a multifaceted approach in order to assure the full development of our domestic resource base and provide for the expansion of exploration, development, and production of natural gas.

We must look for solutions along many paths which in combination will enable us to overcome our present difficulty.

It is the interaction of new institutions, improvement in existing institutions, and a combination of specific programs, which offer the opportunity to resolve the current gas supply problem and provide the promise for the future.

Specifically, the wellhead regulation of gas prices can serve the public interest if it is administered fairly and firmly with the necessary improvements which will be suggested shortly.

What is needed is more regulation, not less regulation nor a continuation of the status quo. When the issue of deregulation or continued regulation is postulated, it is usually done in terms of two alternatives within a fixed institutional mold.

I will subsequently indicate the basis for improved regulation and the new institutional forces which should work toward assuring an equitable framework for natural gas producers as well as consumers.

In order for regulation at the interstate level to operate successfully, regulation has to be extended to the entire market.

In the recent period we have seen intrastate prices escalate above 50 cents per Mcf. Every increase in intrastate prices provides the rationalization for producers leveraging their request for ever-higher prices before the FPC—as the administrative law judge stated in the recent *Permian II* initial decision, docket No. AR-70-1, December 20, 1972.

In fact, according to the evidence of record, several intrastate purchasers in Permian have standing offers to the producers to better interstate ceilings by 1 or 2 cents per Mcf.

The usual explanation given is that the pipeline must meet the intrastate price in order to obtain the gas. While this may have some practical appeal, it does not provide a valid basis for the determination of just and reasonable prices in an imperfect market.

There is no more reason to think that the intrastate market is any more competitive structurally than the interstate market. In fact, recent testimony by one of the applicants in the *Belco* proceeding indicated intrastate prices were above 50 cents per Mcf. In order to justify the 45 cents per Mcf requested by the applicant, he pointed to the extensive intrastate pipeline system operated by Continental Oil Co. and the fact that they were paying substantially in excess of 50 cents for gas for its intrastate network.

Obviously, when Continental Oil seeks to commit supplies to the interstate market, it is very simple to point to the price which is being paid intrastate for gas supplies. This is not an unusual example because many other major producers are intrastate purchasers of gas supplies, as indicated in Dr. Wilson's testimony before this committee.

The producers' escalation of prices is illustrated by the recent intrastate sale of natural gas by the Inexco Oil Co. to the Southern Union Gas Co. at 52 cents per Mcf.

Evidence in the *Belco* proceeding shows that Inexco is engaged in a number of joint ventures with its major partners, Continental Oil and Exxon Corp., in the joint ownership of State of Louisiana leases. To the extent that Inexco can escalate intrastate prices, they, as well as the major producers, benefit because of the insistence that interstate pipelines must match the intrastate price.

Obviously, to the extent that producers insist that interstate purchasers match the intrastate price, we will depart from a cost-based determination and gravitate toward a monopolistic, market-determined basis for pricing.

In addition, it is a very easy step, after justifying matching intrastate prices for short-term supplies, to take the next step—that long-term commitments to the interstate market should be something above the intrastate price.

In this manner, the possibility of utilizing cost-based regulated rates on the interstate level can be completely undermined.

The administrative law judge in Permian II concluded it was essential to extend regulation to the intrastate market because:

"The evidence of record here shows that regulation of the intrastate aspects of producer sales of natural gas would result in more effective regulation of the natural gas industry based upon the principles of consumer protection balanced against setting a just and reasonable return to the producers."

Last, the only way in which social priorities can be implemented on a uniform basis is to regulate both intrastate and interstate sales of natural gas. It appears that we have a dual set of standards when supplies of gas in the intrastate market are available for end uses which are drastically curtailed in the interstate sector.

Broader social equities would dictate uniform curtailment priorities in both markets. There is no doubt that the intrastate market can always offer a little more than any price ceiling set by the FPC, and those needs will be satisfied first, and only the differential supplies will be available for the interstate sector.

While there have been many suggestions concerning the need to increase the number of offshore sales and the size of the package made available for bid, very few proposals have been made to improve offshore leasing practices to accelerate supply availability or to mitigate the domination by the majors of offshore reserves. From a public interest standpoint, it is not good enough to stress the need for three or more sales a year of offshore leases, but specific requirements are necessary to assure more rapid development and production from these leases.

In the licensing of producers in the North Sea, the British Government insists upon a work program which must be implemented by the companies in order to assure rapid exploration and commitment of gas.

In addition, there are many advantages to the royalty bidding system used by the British Government in the North Sea in lieu of our bonus bidding arrangement for offshore Federal domain reserves. It would appear that the Treasury could obtain as much revenue from

Royalty bidding arrangements in which the applicants could vary the royalty paid in place of the cash bonus bid with a one-sixth fixed royalty that currently prevails.

In addition, the royalty bid could provide new entry for smaller companies which previously could not bid on Federal offshore acreage because of the large cash requirements.

This has been a particularly serious problem resulting in the major petroleum companies dominating the development of offshore acreage. The only opportunities in the past for smaller firms were to join as junior partners in a consortium leaving very little option for competitive interplay.

The modification of the bidding arrangement offshore provides the Interior Department with a significant opportunity to enhance new entry and infuse greater competition in the offshore area.

In addition, Interior should be encouraged, or directed, to modify the leasing procedures to provide a more effective means of assuring rapid commitment of offshore reserves.

Legislation should be introduced in Congress providing for an independent Government agency to determine on a reservoir-by-reservoir basis our domestic natural gas reserves.

In order to lay to rest all of the controversy and uncertainty surrounding proved reserve estimates, we should assure the public of accurate, reliable, and uncontroverted reserve data which will enable us to determine the amount of gas reserves. An effort should be made to work toward greater uniformity in reserve estimation so that we can determine the amount of proved reserves on an area-by-area basis in such a manner that we can verify the associated and nonassociated reserves with a minimum amount of uncertainty.

This is particularly important in light of the fact that, historically, over 60 percent of new reserve additions are attributable to extensions and revisions.

Of particular concern are the negative revisions, deductions, to proved reserves in the last 4 years in the AGA proved reserve estimates.

Finally, of crucial significance is the determination on a continuing basis of the uncommitted reserves available for sale as part of the total proved reserves.

The significance of an independent estimate goes beyond verification of available supplies because it is basic to the determination of productivity from the successful gas wells drilled, which in turn is one of the most crucial factors that underlie the determination of the nationwide cost of finding and producing new nonassociated gas in the various area rate proceedings before the Commission.

Congress should give serious consideration to the formation of a Federal corporation to operate offshore in order to assure new natural gas reserves at reasonable cost.

Current estimates of potential offshore reserves run as high as 850 trillion cubic feet. Currently, approximately 2 percent of our offshore lands have been leased.

One of the purposes of the TVA was to bring about significant new development of low-cost energy in order to serve the country's needs. The same problem exists today with even greater intensity.

The example of the British Gas Council in the North Sea illustrates the type of independence the Government agency could utilize because of the access to its own reserves.

A Federal corporation would be motivated to explore, develop, and rapidly commit new supplies because of its sensitivity to broader social needs.

In addition, this would provide objective information upon which the Commission could rely as to the actual offshore costs of finding and producing gas. The FTC has never received separate cost information pertaining to offshore reserves.

Most importantly, a Federal corporation would provide a new competitor to the major producing companies and prompt commitment of available reserves and development of prospective reserves because of the awareness that the new corporation could accelerate its efforts and bring on independent supplies of gas.

In another sense, the Federal corporation could provide valuable yardstick competition to determine the efficiency and performance of the private operators' offshore operations.

Finally, a Government entity should be sensitive to the environmental safeguards and conservation practices required in offshore operation.

An initial distinction must be made regarding rate regulation of flowing gas as distinct from that of new gas. An equitable basis for price determination for old gas should be premised upon historical costs incurred by producers and a fair return for the funds invested.

In those instances where area ceilings are inadequate, provisions have been made in the area rate proceedings for special relief.

With respect to increments of new supplies, a rate must be determined which reflects incremental costs of gas, including a fair return in order to assure efficient resource allocation and capital attraction.

Recent staff efforts to quantify nationwide costs provide estimates of finding and producing new nonassociated gas ranging from 27.6 cents to 35.7 cents, at 14.65 pounds per square inch absolute—excluding production taxes but including a 15-percent rate of return—in the *Belco* proceeding, to 32 to 35.5 cents, at 14.65 pounds per square inch absolute in docket No. R–389–B. These are the relevant economic factors which would conform to the supply-price required in a competitive market.

These are the prerequisites for regulatory policy; that is, in order to meet market demands, a stable price must be established which will promote orderly markets and reduce uncertainty for producers in planning future investments for exploration, development, and production.

Therefore, I would recommend that when a price is determined a moratorium be imposed on future increases. In order to protect against possible inflation and the erosion of rate ceilings because of future cost increases, a mechanism should be developed to allow for adjustments in the variable costs of the rate ceiling.

There has been a great deal of discussion concerning the advisability of a single, nationwide area rate for new gas sales. While I think it is essential to have a nationwide proceeding in which national costs are determined for all new gas, it does not follow that one nationwide rate for all producing areas is the optimal solution.

Nationwide costs should be used to make adjustments to the existing area rate ceilings. The difference in the area rate ceilings reflect important historical as well as institutional factors. More importantly, there is locational difference depending upon nearness to market.

For example, because Appalachia is closer to the market the price for this area should reflect the transportation differential. This is in effect the cost avoidance of transporting gas from the Southwest areas.

In addition, there is the danger that if a single coiling price is set, it will be the highest price required by any one area because to establish a lower price would discourage the finding and production of gas from higher cost areas, such as Appalachia. Yet, to set the price in the Southwest at the level of the Appalachian price is to give this producing area the transportation differential and a premium which has nothing to do with the costs of bringing gas to market.

Conversely, to set a nationwide ceiling price based upon the Southwest region would discourage exploration and development in Appalachia and Rocky Mountains.

Therefore, the logic of the current variation in rate ceilings should be maintained and a nationwide costing should be used to modify existing area rates.

This will permit the utilization of a nationwide proceeding to adjust rates for all areas simultaneously and avoid the time-consuming, individual area rate determinations.

In addition, it is necessary to implement and expand the moribund data collection rulemaking docket No. R-168-625, now 5 years in an indecisive status, in order to obtain the needed information on a continuing and regular basis for meaningful producer rate regulation.

For effective and expeditious rate determination, it is essential that the Commission have the relevant empirical data and cost information which can be used to update and trend area rates.

There are three essential features of any new regulatory approach which must be stressed.

First, a distinction between new and old gas must be maintained, and the distinction should not be on the basis of the date on which the wells are commenced or committed to contract, but on the date of discovery.

This would discourage holding gas off the market.

Second, an indefinite price moratorium is necessary to discourage speculative anticipations in terms of future higher prices. Last, the intrastate loophole, which has had a devastating impact on interstate regulation, must be closed.

The evidence presented in the various proceedings before the Commission on market structure in the gas-producing industry reflects overwhelming imperfections that can lead to only one conclusion—the gas-producing industry is not workably competitive. To deregulate the price of gas, new or old, would result in billions of dollars of added consumer cost.

The uncertainty concerning supply-price elasticity raises many doubts whether we can be assured of a significant increase of new supplies at higher prices.

In fact, the cost to consumers would be minimized by holding prices to cost-based levels and purchasing alternative fuels at higher prices as supplements.

In addition to a variety of causal factors, there is also evidence that the present unavailability of supply is related to speculative expectations on the part of producers.

There are a number of alternatives available which in combination would protect consumers against exorbitant prices and provide significant new increments of gas supply.

Among these are the extension of controls to the intrastate market, the improvement of offshore leasing policy, the organization of a new Federal entity to infuse greater competition in the petroleum industry and the improvement of producer regulation.

Senator HART. If we do as you say, will we get more gas?

Dr. SCHWARTZ. Yes, sir.

Senator HART. If that is the objective, the price is reasonable. There is a key question in all of this verbiage and it is the validity of the natural gas shortage.

Is there or isn't there a shortage? In your prepared statement you say, as I get it, that there is no question that the domestic resource base in this country is substantial and there is no physical shortage of potential gas supply.

Now, based on your work at the Federal Power Commission, state your opinion as to whether the shortage in fact exists.

Dr. SCHWARTZ. Mr. Chairman, I tried to objectify what information we could get by indicating the amount of production that is shut-in in offshore reserves. First, there are a substantial number of wells that are shut-in.

Second, I have heard a great deal about it taking 3 to 5 years in order to go from an exploratory effort to a final production. The truth is, if you want to quickly develop gas in existing fields, this can be done in significantly less time.

If you look at the Potential Supply Committee record and that 1,100 trillion cubic feet which is the conservative estimate—and the USGS does not break out the 2,100 trillion cubic feet to get this kind of stratification—you will find there are three categories under the term "potential." One is "probably." One is "possible." The other is "speculative."

In that "probable" category there are 225 trillion cubic feet. That is the reserve that can be developed quickly in much less than the 3 to 5 years we keep hearing about all the time.

In fact, I see certificate applications come through the Commission every day, and the indications are that in less than a year the reserves are brought on stream.

So I think the solution is very rapid development drilling. This will bring us the gas flow, and not in 3 to 5 years. It is this "probable" category that is significant in terms of immediate supply.

Senator HART. I have a second question. They key to this debate is whether there is workable competition in this industry.

Now, you heard the figures, and you used some yourself. As an economist familiar with the industry, how significant is the regional marketing concept before you can make a judgment as to concentration or competition?

Dr. SCHWARTZ. Obviously, the pipelines are tied to a producing area. They are fixed physical facilities. It is the regional market that prescribes the relevant market for natural gas and not the national market, which is just a conglomeration.

It is those regional markets because the pipeline cannot move its facility from one market to the other.

Therefore, you have to look at the regional markets and control the supplies in that regional market in order to estimate concentrations.

Senator HART. Mr. Nash.

Mr. NASH. Just some very brief questions, Dr. Schwartz.

As I understand it from the testimony of yesterday, although there are significant regional markets, the pipelines are tied together through nationwide interties.

Now, could you explain for the record why even though the regions are intertwined through the nationwide pipeline system, we should still not consider the relevant market as a nationwide market?

Dr. SCHWARTZ. Whatever you may have been presented with yesterday in terms of interties, I would like for someone to tell me if in fact there is a tie between El Paso and Colorado Interstate, which pull gas out of the Permian in the Rocky Mountain area, and between Transcontinental Pipeline and Texas Eastern in Tennessee, which pull gas out of southern Louisiana to serve the east coast. There is not an intertie among all pipelines, obviously.

Certain pipelines secure gas in discrete geographical areas, and others, in other geographical areas.

In addition to that fact, it is irrelevant whether or not there are exchanges among pipelines when in fact you may have one line full without any capacity. Therefore, you have to pick up the gas in that market where you have capacity.

Mr. NASH. Thank you.

Some witnesses indicated the difficulty in projecting the cost to consumers from deregulation of new gas alone. Do you have any basis for providing the record with a projection of what the cost to consumers might be if only new gas were deregulated?

Dr. SCHWARTZ. There is obviously a question of defining what we mean by new gas. I think the industry's position is that gas is gas. Physically there is no difference from gas that is flowing now and gas that may be coming on later, and the commodity value should be the same.

But if you would try to legislate and say that everything under the contract now stays under contract at those terms, and everything which has been approved by the Commission, if they set aside contracts that are above ceilings, then you have a question of quantifying in fact what is the amount of new gas.

That is what we have been unable to obtain from the AGA, very frankly.

I can't tell you because the proved reserves just encompass everything, and you can't break out new gas from old gas.

Mr. NASH. On page 17 you indicate you use a proxy for uncommitted reserves in connection with testimony presented in the *Belco* case.

We have received information respecting actual committed reserves. Can you tell me why your office used a proxy rather than uncommitted reserve concentration ratios?

Dr. SCHWARTZ. Well, our office did try to obtain that information, and a request was made of the people in the Bureau of Natural Gas for that information. We told them that we needed the aggregate forum for the *Belco* proceeding.

Initially, they provided us with information in which they found some errors. When we went back to get corrections of those errors, we found that a very long time period elapsed, and we could not obtain the information in time for its inclusion in the *Belco* proceeding.

Mr. NASH. If you don't think you can answer my final question, Dr. Schwartz, feel free to so state. I would like to know whether, in your view, the chief economist of the Federal Power Commission, the assistant chief economist of the Federal Power Commission, and the chief for the Division of Economic Study all agree that the natural gas producing industry is not workably competitive?

Dr. SCHWARTZ. It is my understanding that all three members of the Office of Economics in those positions you have cited agree that the market is not structurally competitive.

Mr. NASH. Thank you, Dr. Schwartz.

Mr. CHUMBRIS. Dr. Schwartz, I have no questions to ask you for the simple reason that you are pretty strong in your views, whereas there are others who have and will testify and take a different position. Rather than debate the issue, we will just leave it for the Senators up here to judge the testimony on its merits and make a determination. I don't want to pit the staff against the Commission.

We on the staff level feel we have a good argument. We present it to our Senators and they say it is a fine argument, but they vote the other way. That is how these problems are sometimes resolved.

You have that problem with your Commission, I am sure. We are glad to have you here, and as I say, your testimony will have to be judged in light of the full record.

Dr. SCHWARTZ. I think that is very appropriate, Mr. Chumbris.

Mr. CHUMBRIS. Thank you.

Dr. SCHWARTZ. Thank you.

Senator HART. I think I should make the comment, while Dr. Schwartz is here and before we hear from Dr. Wilson, that we appreciate getting your views, and we recognize that there is a difference, as Mr. Chumbris said, between your views and those voiced yesterday by Chairman Nassikas—a difference in many areas.

To assist those of us on the committee to develop a judgment on the complex problems that are involved, it seemed to us that we would be much more likely to get that kind of a record or make that kind of judgment if we had the opportunity to hear from you.

The more competing voices and different ideas that are fed into the machine, in theory, the more likely sound judgments will result.

It doesn't always follow, but your statement does encourage a very vigorous public debate, and we do that because we think that is the way we get the truth.

I am sure the Chairman of the Federal Power Commission recognizes that and understands it, and would not in any fashion want to have either you or Dr. Wilson penalized for responding to this subcommittee's request.

Mr. CHUMBRIS. That was the main reason that I asked him that question originally, so it wouldn't appear as though he and his coworkers were running to us to present their point of view.

[The following tables, previously referred to, were appended to Dr. Schwartz' prepared statement. Testimony resumes on p. 456.]

TABLE I.—TOTAL WELLS DRILLED FOR HYDROCARBONS, TOTAL GAS AND GAS CONDENSATE WELLS DRILLED TOTAL GAS AND GAS CONDENSATE EXPLORATORY AND DEVELOPMENTAL WELLS DRILLED, TOTAL UNITED STATES, 1963-72

	Total wells drilled for hydrocarbons		Total gas and gas condensate wells drilled		Total gas and gas condensate exploratory wells drilled		Total gas and gas condensate developmental wells drilled	
	Number of wells	Thousand feet	Number of wells	Thousand feet	Number of wells	Thousand feet	Number of wells	Thousand feet
Year:								
1963	41, 467	182, 649	4, 570	24, 533	664	4, 230	3, 906	20, 303
1964	42, 293	187, 420	4, 694	25, 597	577	4, 204	4, 117	21, 394
1965	38, 773	174, 882	4, 482	24, 931	515	3, 757	3, 967	21, 174
1966	35, 730	165, 420	4, 321	25, 636	578	4, 881	3, 743	20, 755
1967	31, 633	144, 723	3, 602	21, 482	556	4, 231	3, 046	17, 251
1968	30, 265	147, 721	3, 329	20, 152	430	3, 320	2, 899	16, 832
1969	29, 945	150, 907	3, 656	21, 829	616	4, 985	3, 040	16, 844
1970	26, 784	135, 951	3, 225	19, 830	481	3, 675	2, 744	16, 155
1971	25, 357	127, 092	3, 399	20, 046	437	3, 328	2, 962	16, 718
1972	27, 087	137, 765	4, 777	26, 593	601	4, 592	4, 176	22, 001
Averages:								
1963-67	37, 979	171, 019	4, 334	24, 436	578	4, 261	3, 756	20, 175
1968-72	27, 888	139, 887	3, 677	21, 690	513	3, 980	3, 164	17, 710
Percentage decline over 5-yr average, 1963-67, compared with 1968-72	26. 6	18. 2	15. 2	11. 2	11. 2	6. 6	15. 8	12. 2

Source: World Oil, American Association of Petroleum Geologists, American Petroleum Institute.

TABLE II.—NATURAL GAS RESERVE, PRODUCTION, AND PRICE DATA, 1963-72

	Natural gas reserve and production data [1]				
	Net production [2]	Total reserve additions [2]	Findings to production ratio	Weighted average initial contract price [3] [4]	Weighted average rate ceilings for new gas [4] [5]
1963	14. 5	18. 1	1. 2	17. 0	18. 2
1964	15. 3	20. 1	1. 3	16. 2	18. 1
1965	16. 2	21. 2	1. 3	17. 4	18. 1
1966	17. 5	19. 2	1. 1	17. 4	18. 1
1967	18. 4	21. 1	1. 1	18. 6	18. 1
Average, 1963-67	16. 4	19. 9		17. 3	18. 1
1968	19. 3	12. 0	. 6	19. 0	17. 9
1969	20. 6	8. 3	. 4	19. 7	17. 6
1970	21. 8	11. 1	. 5	20. 8	18. 0
1971	21. 9	9. 4	. 4	25. 8	24. 6
1972	22. 4	9. 4	. 4	30. 4	24. 9
Average, 1968-72	21. 2	10. 0		23. 1	20. 6
Percent change	29. 3	−49. 7		33. 5	13. 8

[1] Total United States exclusive of Alaska.
[2] Trillion cubic feet.
[3] At 14.65 lb/in.²a.
[4] Cents per thousand cubic feet.
[5] FPC orders and opinions.

Source: "Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas in the United States and Canada," American Gas Association. Exhibit No. 24, Docket No. AR69-1, Southern Louisiana Area; FPC Form 301B, Billing Statements and Certificate Applications.

TABLE III.—WEIGHTED AVERAGE INITIAL PRICES UNDER LONG TERM PRODUCERS CONTRACTS, BY AREA, BY YEAR OF AUTHORIZATION[1]

Year of authorization and area	Number of contracts	Total volumes[2]	Contract revenues	Weighted average[3] (cents)
1970:				
Hugoton-Anadarko	44	30, 996, 755	$6, 160, 649	19.88
South Louisiana	49	100, 354, 454	23, 066, 711	22.99
State	19	43, 149, 239	10, 788, 234	25.00
Federal Domain	30	57, 205, 215	12, 278, 477	21.46
Permian Basin	5	13, 793, 504	2, 850, 339	20.66
Rocky Mountain	12	36, 964, 356	6, 103, 165	16.51
Other Southwest	5	4, 734, 936	968, 748	20.46
Texas Gulf Coast	8	12, 083, 990	2, 254, 857	18.66
State	8	12, 083, 990	2, 254, 875	18.66
Federal Domain				
Total, 1970	123	198, 927, 995	41, 404, 469	20.81
1971:				
Hugoton-Anadarko	31	24, 074, 480	5, 603, 420	23.28
South Louisiana	76	233, 066, 139	64, 753, 464	27.78
State	38	75, 282, 695	19, 620, 725	26.06
Federal Domain	38	157, 783, 444	45, 132, 739	28.60
Permian Basin	31	65, 312, 760	16, 782, 245	25.70
Rocky Mountain	17	22, 728, 312	2, 950, 219	12.98
Other Southwest	22	6, 153, 000	1, 475, 206	23.98
Texas Gulf Coast	15,	66, 540, 400	16, 123, 292	24.23
State	8	13, 080, 000	3, 198, 000	24.45
Federal Domain	7	53, 460, 400	12, 925, 292	24.18
Total, 1971	192	417, 875, 091	107, 687, 846	25.77
1972:				
Hugoton-Anadarko	39	24, 742, 500	6, 504, 523	26.29
South Louisiana	56	309, 607, 898	96, 749, 836	31.25
State	17	23, 880, 251	7, 327, 348	30.68
Federal Domain	39	285, 727, 647	89, 422, 488	31.30
Permian Basin	39	30, 728, 028	11, 365, 934	36.99
Rocky Mountain	28	15, 943, 300	3, 481, 304	21.84
Other Southwest	20	19, 082, 450	4, 977, 055	26.08
Texas Gulf Coast	12	32, 172, 000	8, 523, 360	26.49
State	12	32, 172, 000	8, 523, 360	26.49
Federal Domain				
Total, 1972	194	432, 276, 176	131. 602, 102	30.44
1970–72:				
Hugoton-Anadarko	114	79, 813, 735	18, 268, 592	22.89
South Louisiana	181	643, 028, 491	184, 570, 011	28.70
State	74	142, 312, 185	37, 736, 307	26.52
Federal Domain	107	500, 716, 306	146, 833, 704	29.32
Permian Basin	75	109, 834, 292	30, 998, 518	28.22
Rocky Mountain	57	75, 635, 968	12, 534, 688	16.57
Other Southwest	47	29, 970, 386	7, 421, 009	24.76
Texas Gulf Coast	35	110, 796, 390	26, 901, 509	24.28
State	28	57, 335, 990	13, 976, 217	24.38
Federal Domain	7	53, 460, 400	12, 925, 292	24.18
Total 1970–72	509	1, 049, 079, 262	280, 694, 327	26.76

[1] Contract analysis based on large producer (annual sales over 10,000,000,000 ft^3) rate schedules authorized by FPC during 1970–72. Volumes based on FPC form 301-B, billing statements, and initial contract prices based on producer certificate applications.

[2] Thousand cubic feet at 14.65 psia.

[3] Initial price per thousand cubic feet.

TABLE IV.—OFFSHORE LOUISIANA FEDERAL OIL AND GAS LEASE SALES IN 1962 AND 1970

	Wildcat lease sales dated Mar. 13, 1962, and Mar. 16, 1962		Wildcat lease sale dated Dec. 15, 1970	
	Number of leases	Bonus paid (millions)	Number of leases	Bonuses paid (millions)
(1) Total sold	401	$445.0	117	$845.9
(2) Currently producing	143	$218.0	9	$146.2
(Percent of total)	35.7	49.0	7.7	17.3
(3) Currently classified producing—shut-in	55	$56.8	38	$346.1
(Percent of total)	13.7	12.8	32.5	40.9
(4) Producing plus producing—shut-in	198	$274.8	47	$492.3
(Percent of total)	49.4	61.8	40.2	58.2
(5) Producing shut-in as a percent of producing plus producing—shut-in	27.8	20.7	80.8	70.3
(6) Not classified			70	$353.6
(Percent of total)			59.8	41.8

Source: Department of the Interior, Bureau of Land Management, serial register pages as of January 1973.

TABLE V.—THE COST OF INCREMENTAL GAS SUPPLIES UNDER VARYING SUPPLY-PRICE ELASTICITY ASSUMPTIONS

ASSUMING 10 TRILLION CUBIC FEET (T FT^3) AND 25 CENTS PRICE PER THOUSAND CUBIC FEET (M FT^3)

	Price increase to 37.5 cents per M ft^3		Price increase to 50 cents per M ft^3	
	Supply/increase (T ft^3)	Cost of supply increment per M ft^3	Supply increase (T ft^3)	Cost of supply increment per M ft^3
Supply/price elasticity:				
1	0.5	$2.87	1.0	$3.00
2	1.0	1.62	2.0	1.75
3	1.5	1.21	3.0	1.33
4	2.0	1.00	4.0	1.12
5	2.5	.87	5.0	1.00

	Price increase to 45.5 cents per M ft^3		Price increase to 59.5 cents per M ft^3	
	Supply/increase (T ft^3)	Cost of supply increment per M ft^3	Supply increase (T ft^3)	Cost of supply increment per M ft^3
Supply/price elasticity:				
1	0.3	$3.95	0.7	$4.09
2	.6	2.20	1.4	2.34
3	.9	1.62	2.1	1.76
4	1.2	1.33	2.8	1.47
5	1.5	1.15	3.5	1.29

TABLE VI.—SUMMARY TABLE OF CONTRACTS OF MAJOR PRODUCERS EXPIRING BY THEIR OWN TERMS FOR 1973 THROUGH 1980, BY YEAR, FOR SOUTH LOUISIANA, PERMIAN BASIN, HUGOTON-ANADARKO, AND TEXAS GULF COAST AREAS[1]

[[Dollar amounts in thousands]

Year of expiration and area	Volumes sold (MM ft³)	Cumulative volumes (MM ft³)	Revenues collected	Cumulative revenues	Average price per (M ft³) (cents)	Number of contracts	Initial annual impact at 35¢	Cumulative annual impact at 35¢	Initial annual impact at 45¢	Cumulative annual impact at 45¢	Initial annual impact at 60¢	Cumulative annual impact at 60¢	Estimated total differential revenues accruing to producers since 1973		
													At 35¢	At 45¢	At 60¢
1973:															
South Louisiana	344, 837		$71, 558		20. 75	65	$49, 139		$83, 623		$135, 348		$49, 139	$83, 623	$135, 348
Permian	313, 832		51, 196		16. 31	243	58, 665		90, 038		137, 113		58, 665	90, 038	137, 113
Hugoton-Anadarko	54, 152		8, 780		16. 21	71	10, 175		15, 590		23, 713		10, 135	15, 590	23, 713
Texas Gulf Coast	409, 010		69, 135		16, 90	244	74, 031		114, 932		176, 283		74, 031	114, 932	176, 283
Total	1, 121, 831		200, 669		17. 89	623	192, 010		304, 183		472, 457		192, 010	304, 182	472, 457
1974:															
South Louisiana	57, 818		12, 466		21. 56	7	7, 771		13, 553		22, 225		106, 049	180, 799	292, 921
Permian	16, 050		2, 768		17. 25	20	2, 849		4, 454		6, 861		120, 179	184, 530	281, 087
Hugoton-Anadarko	8, 486		1, 262		14. 87	29	1, 708		2, 557		3, 830		22. 058	33, 737	51, 256
Texas Gulf Coast	74, 208		12, 025		16. 20	32	13, 951		21, 372		32, 503		162, 013	251, 236	385, 069
Total	156, 562	1, 278, 393	28, 521	$229, 190	18. 22	88	26, 279	$218, 289	41, 936	$346, 119	65, 419	$537, 876	410, 229	650, 302	1, 010, 333
1975:															
South Louisiana	164, 597		36, 580		22. 22	22	21, 035		37, 495		62, 184		183, 994	315, 470	512, 678
Permian	126, 457		19, 791		15. 65	14	24, 469		37, 115		56, 084		206, 162	316, 137	481, 145
Hugoton-Anadarko	4, 787		698		14, 58	31	978		1, 456		2, 174		34, 919	53, 340	80, 973
Texas Gulf Coast	30, 780		5, 399		17. 54	39	5, 374		8, 452		13, 069		255, 369	395, 992	606, 924
Total	326, 621	1, 605, 014	62, 468	291, 658	19. 13	106	51, 856	270, 145	84, 518	430, 637	133, 511	671, 387	680, 444	1, 080, 939	1, 681, 720
1976:															
South Louisiana	284, 403		63, 068		22. 18	47	36, 460		64, 901		107, 561		298, 400	515, 042	839, 996
Permian	14, 651		2, 396		16. 35	46	2, 732		4, 198		6, 395		294, 877	451, 942	687, 598
Hugoton-Anadarko	16, 785		2, 666		15. 88	47	3, 209		4, 888		7, 405		50, 989	77, 831	118, 095
Texas Gulf Coast	32, 898		5, 062		15. 39	32	6, 451		9, 741		14, 675		355, 176	550, 489	843, 454
Total	348, 737	1, 953, 751	73, 192	364, 850	20. 99	183	48, 852	318, 997	83, 728	514, 365	136, 036	807, 423	999, 442	1, 595, 304	2, 489, 143

1977:															
South Louisiana	188, 277		41, 114		21.84	68	24, 777		43, 605		71, 847		437, 583	758, 219	1, 239, 161
Permian	106, 282		17, 534		16.50	73	19, 662		30, 290		46, 233		403, 254	618, 037	940, 284
Hugoton-Anadarko	29, 234		5, 133		17.56	69	5, 098		8, 022		12, 407		72, 157	110, 344	67, 624
Texas Gulf Coast	6, 629		1, 053		15.88	7	1, 267		1, 930		2, 925		456, 250	706, 916	1, 082, 909
Total	330, 422	2, 284, 173	64, 834	429, 684	19.62	217	50, 804	369, 801	83, 847	598, 212	133, 412	940, 835	1, 369, 244	2, 193, 516	3, 429, 978
1978:															
South Louisiana	401, 916		88, 472		22.01	81	52, 209		92, 400		152, 687		628, 975	1, 093, 796	1, 791, 013
Permian	173, 357		30, 574		17.64	48	30, 095		47, 430		73, 434		541, 726	831, 562	1, 266, 404
Hugoton-Anadarko	14, 264		2, 601		18.23	48	2, 392		3, 818		5, 958		95, 717	146, 675	223, 111
Texas Gulf Coast	40, 754		6, 801		16.69	22	7 462		11, 537		17, 650		564, 786	874, 880	1, 340, 014
Total	630, 291	2, 914, 464	128, 448	558, 132	20.38	199	92, 158	461, 959	155, 185	753, 397	249, 729	1, 190, 564	1, 831, 204	2, 946, 913	4, 620, 542
1979:															
South Louisiana	377, 816		80, 094		21.20	80	52, 139		89, 920		146, 592		872, 326	1, 519, 293	2, 489, 457
Permian	124, 083		20, 598		16.60	42	22, 831		35, 240		53, 852		703, 029	1, 080, 327	1, 646, 376
Hugoton-Anadarko	14, 751		2, 768		18.76	42	2, 396		3, 871		6, 083		121, 673	186, 877	284, 681
Texas Gulf Coast	6, 580		1, 412		17.36	22	1, 161		1, 819		2, 806		674, 483	1, 044, 663	1, 599, 925
Total	523, 230	3, 437, 694	104, 602	662, 734	19.99	186	78, 527	540, 486	130, 850	884, 247	209, 333	1, 399, 897	2, 371, 897	3, 831, 160	6, 020, 439
1980:															
South Louisiana	334, 908		72, 710		21.71	77	44, 509		78, 000		128, 236		1, 160, 366	2, 022, 790	3, 316, 137
Permian	28, 819		5, 217		18.10	28	4, 870		7, 752		12, 075		869, 202	1, 336, 844	2, 038, 423
Hugoton-Anadarko	96, 012		18, 491		19.26	83	15, 112		24, 713		39, 115		162, 741	251, 792	385, 366
Texas Gulf Coast	36, 688		6, 713		18.30	34	6, 126		9, 796		15, 299		790, 306	1, 224, 242	1, 875, 135
Total	496, 427	3, 934, 121	103, 131	765, 865	20.77	222	70, 617	611, 103	120, 261	1, 004, 508	194, 725	1, 594, 622	2, 982, 615	4, 835, 668	7, 615, 061
1973–80 area totals:															
South Louisiana	2, 154, 572		466, 062		21.63	447	288, 066		503, 523		826, 709				
Permian	903, 531		150, 074		16.61	514	166, 159		256, 512		392, 042				
Hugoton-Anadarko	238, 471		42, 399		17.78	420	41, 065		64, 915		100, 685				
Texas Gulf Coast	637, 547		107, 330		16.83	443	115, 842		179, 597		275, 229				
1973–80 grand total	3, 934, 121		765, 865		19.47	1, 824	611, 132		1, 004, 547		1, 594, 665				

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[1] Volumes and revenues based on FPC form 301–B filings for 1971. Sources for area rate schedules, including date of contract and initial contract term are for South Louisiana, AR61–2, staff exhibit No. 28–B and AR69–1, staff exhibit No. 45; for Permian Basin, FPC, ADP File No. R/AC2001W2 (tape No. 2000 created Sept. 28, 1972) and Hugoton-Anadarko and Texas Gulf Coast, FPC ADP File No. R/AU-1901W3 (tape Nos. 608, 380, and 1858 created Mar. 1, 1972).

TABLE VII.—TOP 5 PRODUCERS WITH THE HIGHEST 1971 VOLUME SALES UNDER CONTRACTS, EXPIRING BY THEIR OWN TERMS FOR 1973 THROUGH 1980, BY YEAR

Year of expiration and company	Number of contracts	Volumes (MM ft³)	Percent of annual total	Cumulative percent of annual total	Revenues (thousands)	Percent of annual total revenues
SOUTH LOUISIANA[1]						
1973:						
Getty	3	53,375	15.5		$11,798	
Texaco	7	48,215	14.0	29.5	9,407	
Union Oil of California	3	42,317	12.3	41.8	8,109	
Phillips	4	25,574	7.4	49.2	5,751	
Atlantic Richfield	2	25,524	7.4	56.6	4,082	
Total	19	195,005	56.6		39,147	54.7
Annual total	65	344,837			71,559	
1974:						
Humble	1	28,774	49.8		5,935	
Amoco	1	24,733	42.8	92.6	5,582	
Chevron	1	1,373	2.4	95.0	306	
Kerr McGee	1	1,014	1.8	96.8	226	
Continental	1	975	1.7	98.5	212	
Total	5	56,869	98.5		12,261	98.4
Annual total	7	57,818			12,466	
1975:						
Shell	1	50,833	30.9		11,281	
Chevron	2	29,001	17.6	48.5	6,553	
Union Oil of California	2	22,833	13.9	62.4	5,095	
Atlantic Richfield	3	16,869	10.2	72.6	3,783	
Superior	2	13,913	8.5	81.1	3,186	
Total	10	133,449	81.1		29,898	81.7
Annual total	22	164,597			36,580	
1976:						
Chevron	2	48,213	17.0		11,000	
Amoco	8	39,048	13.7	30.7	8,704	
Getty	4	38,869	13.7	44.4	8,424	
Superior	2	35,140	12.4	56.8	8,176	
Gulf	5	34,579	12.2	69.0	7,657	
Total	21	195,849	68.9		43,961	69.7
Annual total	47	284,403			63,068	
1977:						
Continental	5	28,155	15.0		5,948	
Union Oil of California	5	20,152	10.7	25.7	4,148	
Humble	4	19,103	10.1	35.8	4,031	
Phillips	4	19,006	10.1	45.9	4,451	
Atlantic Richfield	2	18,825	10.0	55.9	4,004	
Total	20	105,241	55.9		22,582	54.9
Annual total		188,277			41,114	
1978:						
Union Oil of California	11	75,517	18.8		15,708	
Sun Oil	2	67,766	16.9	35.7	15,619	
Amoco	13	55,720	13.9	49.6	12,432	
Superior	3	48,714	12.1	61.7	11,261	
Humble	9	30,693	7.6	69.3	6,294	
Total	38	278,410	69.3		61,314	69.3
Annual total		401,916			88,472	
1979:						
Shell	16	113,648	30.1		22,872	
Humble	9	50,550	13.4	43.5	10,166	
Getty	4	41,276	10.9	54.4	9,113	
Union Oil of California	3	35,770	9.5	63.9	7,739	
Continental	4	33,218	8.8	72.7	7.840	
Total	36	274,462	72.6		57,730	72.1
Annual total		377,816			80,094	
1980:						
Union Oil of California	3	96,066	28.7		21,579	
Humble	8	84,304	25.2	53.9	16,600	
Superior	5	41,947	12.5	66.4	9,616	
Gulf	5	19,598	5.9	72.3	4,385	
Texaco	6	19,498	5.8	78.1	3,839	
Total	27	261,413	78.1		56,019	77.0
Annual total		334,908			72,710	

TABLE VII.—TOP 5 PRODUCERS WITH THE HIGHEST 1971 VOLUME SALES UNDER CONTRACTS, EXPIRING BY THEIR OWN TERMS FOR 1973 THROUGH 1980, BY YEAR—Continued

Year of expiration and company	Number of contracts	Volumes (MM ft^3)	Percent of annual total	Cumulative percent of annual total	Revenues (thousands)	Percent of annual total revenues
PERMIAN BASIN[2]						
1973:						
Phillips Petroleum	7	66,767	21.3		9,961	
Shell Oil	12	57,299	18.3	39.6	9,144	
Warren Petroleum	2	45,251	14.4	54.0	8,647	
Amoco	16	20,528	6.5	60.5	3,472	
Humble	10	17,680	5.6	66.1	3,119	
Total	47	207,525	66.1		34,343	67.1
Annual total	243	313,832			51,196	
1974:						
Warren Petroleum	1	9,438	58.8		1,793	
Cities Service	1	1,583	9.9	68.7	224	
Texas Pacific	2	1,052	6.6	75.3	116	
Shell	1	947	5.9	81.2	175	
Atlantic Richfield	2	800	5.0	86.2	91	
Total	7	13,820	86.1		2,399	86.7
Annual total	20	16,050			2,768	
1975:						
Phillips	2	113,780	90.0		18,242	
Atlantic	2	7,507	5.9	95.9	1,116	
Union Texas	2	4,147	3.3	99.2	272	
Gulf	1	246	.2	99.4	45	
Mobil	2	215	.2	99.6	25	
Total	9	125,895	99.6		19,700	99.5
Annual total	14	126,457			19,791	
1976:						
Phillips	2	6,390	43.6		1,150	
Shell	5	2,135	14.6	58.2	365	
Hunt Oil	2	1,197	8.2	66.4	202	
Gulf	2	1,168	8.0	74.4	205	
Atlantic	3	570	3.9	78.3	74	
Total	14	11,460	78.2		1,996	83.3
Annual total	46	14,651			2,396	
1977:						
Chevron West	2	22,950	21.6		3,035	
Phillips	4	15,286	14.4	36.0	2,506	
Amoco	4	14,287	13.4	49.4	2,573	
Shell	1	13,173	12.4	61.8	2,380	
Texaco	4	9,983	9.4	71.2	1,718	
Total	15	75,679	71.2		12,212	69.6
Annual total	73	106,282			17,534	
1978:						
Gulf	8	60,073	34.7		9,096	
Phillips	2	40,049	23.1	57.8	6,717	
Perry R. Bass	1	21,596	12.5	70.3	5,899	
Humble	5	18,332	10.6	80.9	3,240	
Atlantic Richfield	7	7,021	4.1	85.0	1,040	
Total	23	147,071	84.9		25,992	85.0
Annual total	48	173,357			30,574	
1979:						
Union Texas	1	58,256	46.9		8,248	
Phillips	1	21,644	17.4	64.3	3,700	
Skelly	2	10,064	8.1	72.4	1,773	
Cabot Corp	2	9,855	7.9	80.3	2,106	
Chevron West	5	9,298	7.5	87.8	2,011	
Total	11	109,117	87.8		17,838	86.6
Annual total	42	124,083			20,598	
1980:						
Skelly	1	16,235	56.3		2,691	
Continental	2	2,843	9.9	66.2	557	
Texaco	3	1,928	6.7	72.9	340	
Gulf	2	1,608	5.6	78.5	439	
Marathon	1	1,605	5.6	84.1	329	
Total	9	24,219	84.0		4,356	83.5
Annual total	28	28,819			5,217	

TABLE VII.—TOP 5 PRODUCERS WITH THE HIGHEST 1971 VOLUME SALES UNDER CONTRACTS, EXPIRING BY THEIR OWN TERMS FOR 1973 THROUGH 1980, BY YEAR—Continued

Year of expiration and company	Number of contracts	Volumes (MM ft^3)	Percent of annual total	Cumulative percent of annual total	Revenues (thousands)	Percent of annual total revenues
HUGOTON-ANADARKO[3]						
1973:						
Phillips	8	28,363	52.4		4,279	
Cities Service Oil Co	2	5,958	11.0	63.4	1,138	
Texaco	3	3,380	6.2	69.6	617	
Amerada Petroleum	2	3,331	6.2	75.8	638	
Warren Petroleum	2	2,644	4.9	80.7	506	
Total	17	43,676	80.7		7,178	81.8
Annual total	71	54,152			8,780	
1974:						
Signal Oil & Gas	1	6,075	71.6		911	
Superior	10	1,006	11.9	83.5	155	
Ashland Oil & Refining	3	852	10.0	93.5	128	
Marathon Oil	1	225	2.7	96.2	34	
Mobil Oil	2	113	1.3	97.5	12	
Total	17	8,271	97.5		1,240	98.3
Annual total	29	8,486			1,262	
1975:						
Texaco	2	1,108	23.1		135	
Atlantic	3	1,010	21.1	44.2	153	
Atlantic Richfield	3	603	12.6	56.8	95	
Mobil Oil	3	585	12.2	69.0	87	
Superior	1	514	10.7	79.7	77	
Total	12	3,820	79.8		547	78.4
Annual total	31	4,787			698	
1976:						
Skelly	2	7,312	43.5		1,125	
Texaco	3	3,266	19.5	63.0	508	
Atlantic Richfield	3	1,917	11.4	74.4	340	
Champlin Petroleum	2	908	5.4	79.8	164	
Sun	7	548	3.3	83.1	88	
Total	17	13,951	83.1		2,225	83.5
Annual total	47	16,785			2,666	
1977:						
Atlantic Richfield	7	12,007	41.1		2,368	
Texaco	6	6,147	21.0	62.1	763	
Diamond Shamrock	3	2,971	10.2	72.3	551	
Mobil Oil	7	2,144	7.3	79.6	417	
Helmerich & Payne	5	1,089	3.7	83.3	204	
Total	28	24,358	83.3		4,303	83.8
Annual total	69	29,234			5,133	
1978:						
Sun	1	3,299	23.1		626	
Texaco	3	2,610	18.3	41.4	413	
Humble Oil & Refining	3	2,223	15.6	57.0	422	
Mobil Oil	5	1,923	13.5	70.5	369	
Gulf Oil	4	916	6.4	76.9	174	
Total	16	10,971	76.9		2,004	77.0
Annual total	48	14,264			2,601	
1979:						
Texaco	2	4,495	30.5		874	
Atlantic	6	3,119	21.1	51.6	587	
Diamond Shamrock	1	966	6.5	58.1	191	
Sun	2	807	5.5	63.6	155	
Shell	1	798	5.4	69.0	144	
Total	12	10,185	69.0		1,951	70.5
Annual total	42	14,751			2,768	

TABLE VII.—TOP 5 PRODUCERS WITH THE HIGHEST 1971 VOLUME SALES UNDER CONTRACTS, EXPIRING BY THEIR OWN TERMS FOR 1973 THROUGH 1980, BY YEAR—Continued

Year of expiration and company	Number of contracts	Volumes (MM ft³)	Percent of annual total	Cumulative percent of annual total	Revenues (thousands)	Percent of annual total revenues
1980:						
Shell	3	28,126	29.3		5,571	
Cities Service	2	12,726	13.3	42.6	2,377	
Pan American Petroleum	12	11,352	11.8	54.4	2,183	
Mobil	2	9,352	9.7	64.1	1,784	
Atlantic	4	8,407	8.8	72.9	1,635	
Total	23	69,963	72.9		13,550	73.3
Annual total	83	96,012			18,491	
TEXAS GULF COAST [4]						
1973:						
Shell Oil	9	64,638	15.8		11,377	
Mobil	14	60,409	14.8	30.6	10,710	
Sun Oil	25	45,898	11.2	41.8	7,636	
Pan American Petroleum	27	40,649	9.9	51.7	6,914	
Atlantic Richfield	36	40,007	9.8	61.5	6,525	
Total	111	251,601	61.5		43,162	62.4
Annual total	244	409,010			69,135	
1974:						
Champlin Petroleum	2	41,745	56.3		6,338	
Shell Oil	1	13,604	18.3	74.6	2,699	
Texaco	1	4,866	6.6	81.2	813	
Sun Oil	7	3,482	4.7	85.9	544	
Atlantic Richfield	2	2,845	3.8	89.7	431	
Total	13	66,542	89.7		10,825	90.0
Annual total	32	74,208			12,025	
1975:						
Gulf Oil	5	12,799	41.6		2,336	
Atlantic Richfield	6	6,621	21.5	63.1	1,162	
Mobil Oil	1	2,675	8.7	71.8	446	
Shell Oil	3	1,920	6.2	78.0	359	
Cities Service (1970)	1	1,820	5.9	83.9	266	
Total	16	25,835	83.9		4,569	84.6
Annual total	39	30,780			5,399	
1976:						
Cities Service (1970)	1	9,594	29.2		1,412	
Coastal States	2	5,192	15.8	45.0	805	
Mobil Oil	5	2,351	7.1	52.1	360	
Shell Oil	1	2,293	7.0	59.1	390	
Atlantic Richfield	7	2,196	6.7	65.8	325	
Total	16	21,626	65.7		3,292	65.0
Annual total	43	32,898			5,062	
1977:						
Texaco	2	5,655	85.3		903	
Atlantic Richfield	1	807	12.2	97.5	122	
Gulf Oil	1	62	1.0	98.5	10	
Continental Oil	1	43	.6	99.1	8	
Tenneco Oil	1	42	.6	99.7	7	
Total	6	6,609	99.7		1,050	99.7
Annual total	7	6,629			1,053	
1978:						
Champlin Petroleum	1	21,809	53.5		3,284	
Phillips Petroleum	2	5,898	14.5	68.0	1,236	
Shell Oil	1	4,755	11.7	79.7	908	
Humble Oil	2	2,056	5.0	84.7	322	
Getty Oil	2	1,935	4.7	89.4	322	
Total	8	36,453	89.4		6,072	89.3
Annual total	22	40,754			6,801	

TABLE VII —TOP 5 PRODUCERS WITH THE HIGHEST 1971 VOLUME SALES UNDER CONTRACTS, EXPIRING BY THEIR OWN TERMS FOR 1973 THROUGH 1980, BY YEAR—Continued

Year of expiration and company	Number of contracts	Volumes (MM ft³)	Percent of annual total	Cumulative percent of annual total	Revenues (thousands)	Percent of annual total revenues
1979:						
Cities Service Oil	2	1,851	28.1		327	
American Petroleum of Texas	3	1,360	20.7	48.8	217	
Mobil Oil	1	1,127	17.1	65.9	174	
Shell Oil	1	509	7.7	73.6	94	
Texaco	3	496	7.5	81.1	97	
Total	10	5,343	81.2		909	79.6
Annual total	22	6,580			1,142	
1980:						
Atlantic Richfield	4	10,681	29.1		2,096	
Tenneco	4	6,580	17.9	47.0	1,164	
Austral Oil	1	6,252	17.0	64.0	1,150	
Humble Oil	5	3,157	8.6	72.6	575	
Sun Oil	5	2,478	6.8	79.4	457	
Total	19	29,148	79.4		5,442	81.1
Annual total	34	36,688			6,713	

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[1] Volumes and revenues based on FPC form 301-B filings for 1971. Sources for area rate schedules, including date of contract and initial contract term are for south-Louisiana, AR61-2, staff exhibit No. 28-B and AR69-1, staff exhibit No. 45.

[2] Volumes and revenues based on FPC form 301-B filings for 1971. Sources for area rate schedules, including date of contract and initial contract term are for Permian Basin, FPC, ADP file No. R/AC2001W2 (tape No. 2000 created September 28, 1972).

[3] Volumes and revenues based on FPC form 301-B filings for 1971. Sources for area rate schedules, including date of contract and initial contract term are for Hugoton-Anadarko, FPC ADP file No. R/AU1901W3 (tape Nos. 608, 380, and 1858 created March 1, 1972).

[4] Volumes and revenues based on FPC form 301-B filings for 1971. Sources for area rate schedules, including date of contract and initial contract term are for Texas Gulf Coast, FPC ADP file No. R/AU1901W3 (tape Nos. 608, 380, and 1858 created March 1, 1972).

Senator HART. Having been almost indirectly introduced already, we welcome the Chief of the Division of Economic Studies of the Federal Power Commission, Dr. John Wilson.

As with Dr. Schwartz, the subcommittee had an earlier opportunity to meet Dr. Wilson, and we are glad to have him back.

STATEMENT OF DR. JOHN W. WILSON, CHIEF, DIVISION OF ECONOMIC STUDIES, OFFICE OF ECONOMICS, FEDERAL POWER COMMISSION; ACCOMPANIED BY GEORGE DONKIN, STAFF MEMBER

Dr. WILSON. Thank you, sir.

I am John Wilson, Chief of the Division of Economic Studies. Accompanying me this afternoon is George Donkin of my staff. He has played a major role in collecting and assembling the factual information and analysis that we are presenting today.

I realize that time is quite short and my testimony lengthy. I will therefore, present only an oral summary, but I am willing to answer any questions pertaining to any portion of my statement.

Senator HART. And the prepared statement will be printed in full.

Dr. WILSON. Thank you, sir.

The fundamental conclusion that seems inescapable is that the petroleum industry is not in any sense of the word either adequately or workably competitive.

Whether or not a market is competitive depends on the degree of seller rivalry, and whether these sellers are independent. The evidence presented in my testimony shows, quite clearly, that sellers are not independent: they are interdependent upon each other, and the principal form of rivalry now prevailing in gas production markets is rivalry between buyers. Thus, the producers sit back and play one prospective buyer off against another and call this competition. The twisted semantics aside, it is quite clear that whatever name we give it, buyers' rivalry does not foster consumer interests.

Initially, it should be observed that when we address the natural gas producing industry, we are really discussing the petroleum industry. As shown in table 1, the top 14 natural gas producers in 1970 were also among the top 15 oil and liquids producers and among the top 17 petroleum refiners. These 14 leading gas producers were also among the 17 largest sellers of gasoline and other refined petroleum products and among the 17 largest sellers of natural gas to interstate pipelines.

[The table referred to appears in Dr. Wilson's prepared statement at the end of his testimony.]

These same companies are the ones which face consumers from the other side of the so-called energy crisis, in all petroleum markets, and some of them also hold significant supply positions in the coal and uranium industries.

To an economist, it is interesting, though not surprising, that the energy crisis has not created obvious financial difficulties for these firms. In fact, recent evidence suggests quite the opposite. Many of these companies, as well as other firms in the petroleum industry, experienced record profit levels in the first quarter of 1973.

Table 2 presents information on after-tax profits in this most recent quarter as compared with the first quarter of 1972. Every company, without exception, experienced substantial improvement, and the average earnings increase was between 25 and 30 percent.

[The table referred to appears in Dr. Wilson's prepared statement at the end of his testimony.]

As for the concentration of our natural gas supplies, table 3 shows that the top four producers in the major producing areas have generally accounted for 50 percent or more of the new gas sold to interstate pipelines in recent years. The top eight have accounted for 60 to 80 percent or more of annual new commitments.

[The table referred to appears in Dr. Wilson's prepared statement at the end of his testimony.]

A familiar rule of thumb is that in industries where the eight largest firms have at least 50 percent of the sales, normal unrestrained market forces are likely to be an insufficient guarantee against monopolistic market performance. The eight-firm concentration ratios in table 3 are, of course, far above the 50-percent level. Another concentration calculation is persented in table 4. The four-firm and eight-firm ratios shown there are based on an actual survey by the FPC of available uncommitted gas supplies as of December 31, 1971, and June 30, 1972.

[The table referred to appears in Dr. Wilson's prepared statement at the end of his testimony.]

These ratios are extremely high, and they tend to be remarkably stable over time.

Finally, the evidence presented in table 5 demonstrates that concentration appears to be quite high even in a prospective sense. Over 80 percent of the Federal offshore leases acquired, weighted by bonus-dollars paid, in each of 3 recent lease sales were accounted for by the top 8 bidders and their bidding partners.

[The table referred to appears in Dr. Wilson's prepared statement at the end of his testimony.]

In all 3 sales combined, the top 8 accounted for 70 percent of the successful bids.

It is also noteworthy that mergers and acquisitions during the last two decades suggest that concentration is increasing over time. A listing of major petroleum industry mergers is presented in table 6.

[The table referred to appears in Dr. Wilson's prepared statement at the end of his testimony.]

In addition, there has been relative stability in the makeup of the top firms in the industry.

In 1971, the 10 leading interstate natural gas suppliers were: Exxon, Amoco, Shell, Gulf, Phillips, Mobil, Texaco, Union Oil, Atlantic Richfield, and Continental. The first 8 of these were also among the top 9 producers, 15 years earlier. The 2 new entrants into the top 10, Union Oil and Continental, attained entry via merger—Union by acquiring Pure Oil, and Continental through a variety of acquisitions.

In summary, virtually any reasonable measure of seller concentration in natural gas markets indicates that there is a substantial degree of dominance by the large producers.

There is also substantial direct evidence of mutual interdependence between virtually all of the major firms in the petroleum industry. This interdependence includes joint ventures, interlocks, and institutional interties in the following general areas of activity:

1. BIDDING COMBINES

Table 7 lists the major bidding combines which participated in Federal offshore lease sales in 1970 and 1972. Because various majors belonged to two or more of these combines, the web of interdependence is far more pervasive than the membership of any single combine would suggest. Figure 1 illustrates some of the interties that exist between the individual combines.

[The table and figure referred to appear in Dr. Wilson's prepared statement at the end of his testimony.]

As for arguments which allege a procompetitive effect emanating from Federal offshore lease sales, there is very little appeal. In terms of economic analysis, there is little or no substantive difference between the end result obtained from the formation of a bidding combine and the end result of a conspiratorial agreement between oil companies to rotate bids.

Legal authorities would have to be relied upon for cogent reasons as to why the former is warmly embraced by the Interior Department while the latter is viewed as a per se violation of section 1 of the Sherman Act by the Justice Department.

My own view is that the offshore leasing program, as currently administered by the Interior Department, has become one of the most onerous anticompetitive cartelization devices at work in our domestic gas producing industry. Not only is it a vehicle for further joint ventures and the integration of intercorporate interests, but it has also become an effective entry blockade for all but the very largest firms in the industry.

I will mention in passing that table 9 lists potential U.S. onshore and offshore petroleum reserves. Total estimated potential offshore natural gas reserves alone are equal to more than 100 times current U.S. annual production. Some of these reserves will, of course, require technological advances in order to be economically recoverable. It should be noted, however, that as of 1970, total onshore and offshore proved reserves, plus estimated unproved natural gas reserves which are believed to be recoverable under present technological and economic conditions, were equal to about 6 times as much natural gas as has been produced in our entire history, or nearly 100 times our current annual consumption.

[The table referred to appears in Dr. Wilson's prepared statement at the end of his testimony.]

2. BANKING INTERLOCKS

It is illegal under section 8 of the Clayton Act for one person to serve on the boards of two companies that produce the same goods or services. Literally interpreted, this prohibition apparently does not prevent two persons who work for and represent the same individual or corporation from serving on the respective boards of two competing companies.

Thus, a large firm in the financial community can assign two of its vice presidents to serve as directors for two different oil companies.

For example, the most recently available evidence on corporate directors from the banking community shows that, as of 1968, Morgan Guaranty and Trust Company of New York had its employees serving as directors on the boards of Continental Oil, Cities Service, Atlantic Richfield, Belco Petroleum, Columbia Gas, Louisiana Land and Exploration Company and Texas Gulf Sulphur. Morgan also held substantial stock interests in Texas Eastern Transmission Corp. and Panhandle Eastern Pipeline Co. as well as numerous gas distribution utilities.

A listing of certain interlocking directorates in the petroleum industry by major banks, as of 1968, is provided in table 10.

[The table referred to appears in Dr. Wilson's prepared statement at the end of his testimony.]

3. JOINT OWNERSHIP OF OIL PIPELINES

Virtually all of the major integrated petroleum companies hold joint interest with others in the transportation network that moves crude oil and products from producing regions to refineries and markets. A number of these joint ventures and the participants in each are listed in table 11.

[The table referred to appears in Dr. Wilson's prepared statement at the end of his testimony.]

The fact that these specific corporate interties involve only oil does not speak well for competition in natural gas markets. As is well known, the important consideration is that a joint venture provides a common meetingplace where supposedly rival firms may legally cooperate, and, regardless of the purpose of the venture, the result will be a close association and collaboration between the parties involved. This cannot help but spill over into their other activities. Today when one counts the common meetingplaces which pervade the petroleum industry, one is hardly surprised that there is considerable mutual cooperation among the major petroleum companies and little hard-fought competition.

4. JOINT PRODUCTION

Only 4 of the 16 largest majors with interests in Federal offshore producing leases own 50 percent or more of their leases independently. Conversely, 10 of the 16 own 80 percent or more of their offshore properties jointly with each other. In addition, very few companies outside of the top 16 have any independent holdings at all.

In addition to the top 16, 23 medium- to large-size producers were surveyed. Of these, only 2 hold as much as 25 percent of their leases independently, and 17 had no independently owned leases at all. A tabulation of these direct corporate interties is presented in table 12.

[The table referred to appears in Dr. Wilson's prepared statement at the end of his testimony.]

These direct relationships do not, of course, reveal the full degree of mutual interdependence that exists in offshore petroleum production. Table 12 shows, for example, that Mobil Oil, which has 6 independently owned leases, is a joint partner with Continental in 19 leases; with Cities Service and Getty in 8 each; with Gulf in 7; Chevron in 5; and with Exxon and Amoco in 4 each.

[The table referred to appears in Dr. Wilson's prepared statement at the end of his testimony.]

In turn Continental, Cities Service and Getty have a substantial number of joint ventures with Atlantic Richfield and Tenneco, while Gulf has four with Phillips. Amoco has 29 joint ventures with Texaco, 12 with Union Oil of California, 8 with Southern Natural, and 4 each with Kerr McGee, Superior, and Pennzoil.

Thus, the web of offshore production interties is even more encompassing than a superficial reading of table 12 may suggest at first blush. Figure 2 is a more vivid illustration of these complex connections.

The ownership of onshore producing leases is also highly interconnected. Of the 18 largest major producers in the State of Louisiana, 14 have 5 or more direct interlocks with the other 17. Continental for example, has 28 joint ventures with Atlantic, 27 with Cities Service, 27 with Getty, 16 with Mobil, 13 with Exxon, and 11 each with Amoco and Sun.

In addition, 38 other medium and large producers in Louisiana were studied. All had substantial interlocking lease ownership arrangements with the largest majors.

A complete tabulation of these Louisiana lease ownership interlocks is reported in table 13.

[The table referred to appears in Dr. Wilson's prepared statement at the end of his testimony.]

5. INTERNATIONAL JOINT VENTURES

In addition to the interrelated domestic operations of the major American petroleum companies, we should not lose sight of the fact that it is largely these same corporate entities or their affiliates which make up the international oil cartel.

While a limited quantification of 18 international joint ventures is reported in table 15, a review of petroleum industry trade publications over the past decade indicates that there is a far more extensive system of international interties among the major American oil companies. A simple tabulation of reports on international interties as noted in the Oil and Gas Journal is presented in table 16.

[The table referred to appears in Dr. Wilson's prepared statement at the end of his testimony.]

In general, it should be kept in mind that foreign supplies will flow to American markets through the same corporate conduits which are already thoroughly interdependent both domestically and abroad.

6. VERTICAL INTEGRATION

It is a well established fact that vertical integration on the oil side of the petroleum industry has served to inhibit workable competition in crude oil production and gasoline retailing. In general, even the most outspoken critics of natural gas regulation acknowledge the anti-competitive shortcomings induced by vertical integration in oil.

The vertical integration issue on the natural gas side of the petroleum industry has not received equal or adequate attention by industry analysts. As shown in table 17, virtually all of the largest interstate natural gas pipeline companies are also involved in petroleum exploration and development—either directly or through corporate affiliates.

[The table referred to appears in Dr. Wilson's prepared statement at the end of his testimony.]

There can be little doubt that with pipelines and their affiliates heavily involved in petroleum production, the contention that arm's-length bargaining between producers and pipelines will be sufficient to protect the public's interest in just and reasonable natural gas prices is ludicrous. Clearly, this is still another major factual reason for denying that there is any semblance of workable competition in the natural gas industry as it is presently structured.

All of these arrangements bring horizontally and vertically juxtaposed firms into close working relationships with each other. They must work together to further their joint interests. Consequently, each becomes familiar with the others and with each other's operations.

Men in such close working relationships learn to consider one another's interests. This most assuredly is not the kind of institutional setting within which a free market economy can be expected to function efficiently.

The petroleum industry's rhetoric about letting free market forces solve the energy crisis simply makes no sense within the present market context. In order to function both efficiently and in the public interest, free markets must be competitive.

This means that the participants must be structurally and behaviorally independent of each other. That precondition, quite apparently, does not apply to the petroleum industry. Consequently, given present institutional arrangements the industry's free market prescription would not produce a competitive end result.

7. POLICY PROPOSALS

Federal regulation of the field price of natural gas was supposedly designed to deal with anticompetitive problems. Apparently, it is not working well. As in the case of fuel oil and gasoline, natural gas supplies are short and prices are rising rapidly. No one can deny that policy changes are needed.

The prescription offered by the petroleum industry and its various spokesmen is unrestrained market freedom. They prescribe a situation wherein the industry, not the public, would be free—free, that is, to extract the maximum possible price that the market will bear.

Unless capitulation to the monopoly power of private economic interests is now viewed as a national policy alternative, this prescription makes no sense. Certainly, from the consuming public's view, it cannot be described as a rational stratagem.

Both arrogant sellers and desperate buyers could respond to this by saying: "What could possibly be worse for the consumer than having no gas? We might as well pay up and avoid the worst." Obviously, that position may make some sense from the point of view of an individual consumer who has no recourse but to capitulate to monopoly power, but Congress, presumably, is not so constrained.

The first and foremost step which must be taken in order to make the regulatory system workable is to eliminate the intrastate exemption which producers are now able to use as a leverage device in the interstate market. The typical procedure these days is for gas producers to whipsaw interstate prices to higher levels on the basis of the highest prices that have been paid in unregulated intrastate markets.

That this practice undermines the establishment of just and reasonable cost-based rates for natural gas is obvious. Why should producers voluntarily sell gas at competitive, cost-based price levels if there is an alternative unregulated market where they can charge what the traffic will bear and which they can use as a lever to force up interstate prices?

What has not been as obvious, perhaps even unknown to some, is the fact that interstate sellers are also intrastate buyers. They are, therefore, in a unique position to manipulate the so-called market price.

Senator HART. Doctor, let me interrupt, there is a rollcall and it is on a proposition that I am not familiar with. I want to give myself as much time with it as I can.

Dr. WILSON. Yes, sir.

[A brief recess was taken.]

Senator HART. The committee will be in order and we will resume with Dr. Wilson's testimony.

Dr. WILSON. In the fall of 1972, the FPC collected data on large intrastate gas commitments over the most recent 12 months from each of the 75 largest interstate gas suppliers. Information concerning the producers surveyed as well as aggregate quantities and prices were published by the Commission in November 1972. However, the identity of the interstate buyers was not revealed at that time. Table 18, presents such a listing.

[The table referred to appears in Dr. Wilson's prepared statement at the end of his testimony.]

Dr. WILSON. Surely one can be forgiven for suspecting that when Pennzoil, Amoco, Phillips, and Continental, acting as intrastate buyers, bid up the price of gas, there may be some potential for certain fairly obvious ulterior motives.

Second, Congress should seriously consider the merits of establishing an independent public corporation to explore for and develop petroleum hydrocarbons on Federal property.

Without a competitive threat, producers can well afford to move slowly as the growing energy crisis builds support for higher prices. With a viable public corporation that can step in and do the job if they don't, consumers would at least have a better bargaining position.

There are substantial indications that merely providing positive incentives through higher prices is not working well. The FPC has taken a number of significant steps to increase new natural gas prices in the last 2 years, but proved reserves have not grown appreciably.

The result is that now the industry trade press talks about the imminent likelihood of future prices double those that have been instituted recently, which are, themselves, double those that prevailed only a few years ago. In an economic climate such as this, it is seldom the case that those who hold the valuable and rapidly appreciating assets are in any hurry to liquidate their holdings. Why sell today when the price is x, if tomorrow it will be x squared?

Thus, regulation is a scissors with one blade—fair rates can be established, but if producers decide to hold out, regulators have little authority to rectify the situation. The establishment of a viable, Federal competitive threat would make this scissors functional.

Third, it would, of course, be possible to attempt to deal with the anticompetitive features of the petroleum industry through the passage of new antitrust legislation or through the vigorous and creative implementation of existing antitrust statutes. That this will be done without a congressional mandate and sustained popular support seems unlikely. No one familiar with our recent antitrust track record could be overly optimistic about the outcome without some new manifestation of the strongest possible congressional support.

Summary at this point is quite simple. The industry is not competitive. Present regulation is not working well. There are a myriad of ways in which competition can be increased: Reforming the Interior Department's leasing practices; establishing a viable, independent public corporation; vertical divestiture by producers of oil and gas pipelines, and by refiners and gas pipelines of their producing and marketing operations; splitting up of all but the most essential joint ventures, where they remain (for example, unitization of producing fields for conservation purposes), adequate public safeguards; some horizontal divestiture of the largest producers, refiners, and marketers: and others. In order for these reforms to be meaningful, they would have to be many and thorough.

There are also ways of improving regulation: Closing the intrastate regulatory gap; obtaining more and better corporate information so as to be better able to ascertain producing costs: the establishment of a clear understanding that just and reasonable prices should fairly reflect no more than the costs of efficient operations plus a reasonable rate of return; and, perhaps, formal institutional divorcement of the investigatory and public advocacy functions of regulatory agencies from the adjudicatory functions.

There are two solutions that are clearly bad: Continuing as is as if no change is needed, and turning control over to the private monopolists.

I believe that essential regulatory improvements are needed first; they are the easiest to agree upon and can be implemented most rapidly. At the same time, if it is possible, we should begin the long, hard process of restructuring the petroleum industry so as to reform the underlying market structure and, hopefully, make it workably competitive. But that is a longrun goal, not to be confused with the free market force rhetoric which flows on like manna, as if unmindful of the facts and unwary of their consequences.

Thank you. That concludes my oral statement.

Senator HART. Doctor, the subcommittee wants to thank you for the enormous effort that must have gone into the preparation of your statement. I think it is fair to suggest that your statement really represents the most comprehensive collection of public and nonpublic data showing the structure of the natural gas producing industry available.

I think the points you have made on the questions of concentration ratios, the community of interest, and the lack of independence of the companies, constitute major new evidence. This massive testimony, I think, will be of enormous value. I simply want to thank you, and Mr. Donkin as well, for the development of it.

Dr. WILSON. Thank you, sir.

Mr. DONKIN. Thank you, sir.

Senator HART. Now, we always like to reach out and find additional reasons to prove that some earlier action was correct. I am going to do that with your testimony.

Some time ago I introduced the Industrial Reorganization Act, and I suggested that half a dozen areas of our economy probably could be restructured to the benefit of all, and petroleum is one of them. What you have presented here persuades me to think that that suggestion was probably sound.

The action which the press today suggested the Federal Trade Commission may take, argues the same point.

Dr. WILSON. I am familiar with the act, sir, and if you would permit me, I would like to make one observation with respect to the petroleum industry.

I do develop the point to some extent in my prepared testimony and I didn't express it in the summary I gave. We have a very unique situation in the petroleum industry, one that goes far beyond the structural situation that can be factually identified and documented in the other concentrated industries that the subcommittee has singled out for explicit investigation and corrective action.

I do not depreciate the value of concentration ratios. Concentration ratios are a very valuable piece of information from which deductive logic can flow. When we see an industry that is highly concentrated, it is reasonable to believe that the firms in that highly concentrated industry cannot function independently. Any action that any one of those individual firms takes has a direct impact on the others; because of this, the firms know there is going to be reaction when they take this action.

Consequently, a community of interest develops and a live-and-let-live situation evolves. This is why economists have always focused on concentration ratios as an indicative piece of factual evidence that suggests something about the lack of interdependence in an industry.

Now, there is high concentration in our natural gas markets. But in addition to that, there is a vast, overwhelming amount of direct evidence on the lack of interdependence, and I would submit to you that this particular industry, because of the dual evidence that has been developed with respect to it, is particularly worthy of very careful examination.

Senator HART. Doctor, I have made the tentative decision that the subcommittee should proceed to study one of those other industries first. I gave the staff that indication only a week ago, and in light of what you just said and the material you presented to us, I think I should ask the staff to review the bidding and see if perhaps we should change signals and proceed to study the petroleum industry first.

Dr. WILSON. It would certainly make me think that maybe something was accomplished here. Thank you for the compliment.

Senator HART. Mr. Bangert.

Mr. BANGERT. Mr. Nash has some questions.

Mr. NASH. You referred in your testimony to the fact that intrastate gas prices were being used as proxies for free market in arguments before the Federal Power Commission to increase the prices for interstate gas, and then you indicated that you have some information respecting who the purchasers of intrastate gas are, and you identified them as some of the major petroleum companies seeking high prices before the Federal Power Commission. It would be helpful for the record if you indicate whether it is unusual for the major petroleum companies to be the big purchasers of natural gas as well as being producers of natural gas.

Dr. WILSON. The answer to that is no, but apparently, it is not at all unusual. The producers of natural gas, as I have already indicated, are major petroleum companies that use large volumes of natural gas in oil refining operations.

As a matter of fact, we have a number of applications coming into the Federal Power Commission at the present time pertaining to offshore natural gas volumes, this gas being in the Federal domain and thereby being, under the law, in interstate commerce.

However, a number of interesting propositions have been made with respect to some of these volumes. For example, certain producers have indicated; "Well, we can make this gas available. We can pull it out of the ground. It is interstate gas, but we will pull it out of the ground and sell it only if you will allow us to take *x* percent of it and use it in our refineries in Texas or Louisiana and sell only the remainder to the interstate market."

So, it is not only that—as indicated in table 18 of my testimony—most of the large buyers in those areas are also sellers interstate, and sell gas to a large variety of interstate pipelines all over the country; in addition, what I am saying now is that they are also becoming significant buyers, in some cases, of certain volumes that are being produced in the Federal domain offshore.

Mr. NASH. Is that a recent phenomenon—major producers purchasing substantial quantities of gas in intrastate sales?

Dr. WILSON. From the information that I have at my disposal, I know of only the information available in this particular survey.

It is my impression, however, without having other studies that I can bring in to back that up, that this is a fairly long term process. The petroleum refining industry has been around a long time and has been using natural gas in refineries.

Mr. NASH. If the seller of the product is the same as the buyer of the product, why are intrastate sale prices pointed to as a proxie for free market forces?

Dr. WILSON. Precisely, Mr. Nash!

Mr. NASH. I mean, why has this selling been accepted if the facts are as you suggest?

Dr. WILSON. I have not accepted it, Mr. Nash. I don't have an answer to that question. I cannot comprehend an answer.

Mr. NASH. You referred a moment ago the Chairman's Industrial Reorganization Act and made a very good case for giving high priority to the petroleum sector, and you did have some comments in your statement respecting what type of antitrust action ought to be taken. Do you have any particular proposal in mind that you would suggest be considered when and if a restructuring of that industry takes place?

I thought as long as you are here we might have the benefit of your expertise.

Dr. WILSON. I prefer not to shoot from the hip on that. That is a very important question and it is one on which I have some preliminary thoughts.

But it certainly deserves very significant study and recommendation and at some point I would be interested in getting into that.

Senator HART. Well, when we move in that area, we would certainly want to have your considered recommendations.

Dr. WILSON. I would be pleased to give them.

Mr. NASH. As I understand it, you are chief of the Economic Study Division of the Federal Power Commission. Since I am sure the job entails what the name implies, I would like your assessment of the significance of the natural gas reserve study's conclusion that the Nation is suffering from a substantial shortage of natural gas.

Dr. WILSON. First of all I should point out that I did not participate in any way in the Natural Gas Survey. I, therefore, cannot offer any insights into that in any functional sense.

I think that as to the question of whether or not there is a natural gas shortage, however, clearly there is less gas being supplied at the present time than consumers—and here I use the word comprehensively to mean not only residential consumers but industrial consumers—than all consumers would, if they had their druthers, like to consume. Whether or not there is a natural gas shortage, I think, is a somewhat more complex question than that particular factual observation yields an answer to.

I have indicated in one of the tables in my testimony which is on page 36, certain estimates which were provided by the USGS to the FPC's Natural Gas Survey. They are broken down into past production (the first line)—that is, everything that has been produced in the history of the United States until December 31, 1970—and the proved reserves remaining as of that date——

Mr. NASH. Of course, that indicates a substantial amount of potential reserves?

Dr. Wilson. Well, the proved reserves (the second line) is slightly more than a 10-year supply. You see, onshore we have 252, and offshore we have 39. Annual production is about 25. So we have more than a 10-year supply as of that date.

At the present time it is hovering right around a 10-year supply. Now, on the third line we have additional reserves which are defined as recoverable under current technological and economic conditions. This is over 2 trillion Mcf. If you add the proved to those that are not proved but recoverable, and divide that by 25 billion Mcf, which is our current annual production, in that sense we have a 100-year supply, if you can think of it in those terms. That, of course, is overly simplistic.

In addition—I should, I suppose, be explicit on what proved reserves are as against these additional reserves that are recoverable. Proved reserves are—there is a term of art involved—essentially, I have characterized it as being similar to a shelf stock in the retail business. They are gas reserves into which wells have been drilled and, therefore, are ready to flow. In addition, there are substantial additional reserves recoverable under current technological and economic conditions, and we have darn good reason to believe they are there.

The fact is that they just haven't been drilled yet. If you are a producer who is speculating against a 60- or 80-cent price in the future, you don't drill wells into these reserves until you are ready to sell the gas. Why put on all of these extra carrying costs prematurely? So, you see, we have substantial gas and oil reserves yet to be developed in this country.

Now, the question is, "Why aren't they being developed?" The industry would say, we are not giving it enough incentive. Alternatively, I would say there is evidence that there is substantial market power in this industry and a situation for very classical monopolistic behavior—restrain the supply, prices go up.

The studies that the FPC staff has done on costs don't indicate anywhere near the 60- or 80-cent range that industry people are talking about now on the basis of so-called demand justified prices.

Mr. Nash. What are the costs approaching?

Dr. Wilson. Well, in the recent *Belco* case, which is the most recent hearing in which the FPC staff put cost information, the staff recommended 35 cents, which included a 15-percent rate of return after taxes. I personally have not made cost studies.

One of our problems, quite frankly, is that we do not have all the cost data that exists in company files. I think the companies know, to some extent better than we do, what the true costs are from their proprietary information that we have not been able to obtain. But based on present costing methodology, we are told that as of March 1973, costs were somewhere in the 35-cent range.

Now, that includes a 15-percent rate of return after taxes. I have some problems with the application of that methodology under present circumstances because it assumes an unusually low discovery rate per foot drilled—unusually low in a long-term sense. Discovery has not been very great in recent years because there hasn't been an awful lot of exploration and development during this period, and current costing methods have used these most recent drilling results as a basis for cost calculations.

I would prefer to use a longer term basis for estimating that factor because I expect in the future, when drilling activities increase, that our discovery rate, especially in the offshore area, is going to be considerably higher and we may find the cost even below current estimates.

Mr. NASH. Is that to say that estimated reserves and calculating the price were kept low so that the unit cost must necessarily become higher.

Dr. WILSON. No, sir, I do not think that necessarily follows. What I am saying is that if there is not a large-scale exploration and development activity going on, you are not as likely to find new large fields. There tends to be primary emphasis on developing drainage properties. Therefore, the absence of large-scale production of proved reserves in the offshore area in recent years probably yields us an underestimate of what discovery rates are going to be in that offshore area later on.

Mr. NASH. It has been indicated that the returns afforded the producers are insufficient to elicit supply. Can you give us an indication of the types of returns afforded producers that are now being quoted as not sufficiently high?

Dr. WILSON. Well, as I indicated, it has been the Commission's practice to allow for an after-tax rate of return, on total investment not merely on equity, of anywhere from 12 to 15 percent in recent years. In the second *South Louisiana* case and the *Belco* case the Commission allowed for a 15-percent after-tax rate of return on total investment. That, of course, means that if you have a company like Tenneco with substantial debt in their total capitalization—this debt money raised through lending markets; I think Tenneco's imbedded debt cost is slightly in excess of 7 percent—if you have substantial amounts of debt money in your capitalization that has been raised at much lower costs than the 15-percent allowed rate of return overall, then the rate of return actually earned on equity is much higher. So in response to your question, apparently the rates of return that have been allowed for in this 12- to 15-percent range on total capital have not been appropriate as far as the producers are concerned. That assumes, of course, that the cost calculations themselves are accurate.

Mr. NASH. When there is a rate proceeding going on, do you get specific underlying cost data from the companies to allow you to calculate unit costs?

Dr. WILSON. I never have been involved in an area rate case. It is my understanding that that typically does not happen. It has not happened in the producer rate cases in which I have been involved. In area rate cases, company questionnaires have been sent out, but recently we haven't collected anything like that.

Mr. NASH. My last question may take the position that the present return afforded producing companies is adequate and, in point of fact, gas is not being produced in adequate supply for one reason or another.

I would like to know if you have any specific recommendations as to how we can get the gas flowing and get it flowing now rather than several years from now.

Dr. WILSON. Yes, sir. I think the antitrust solution to the problem is long range rather than immediate. Surely there are some things that the Government itself can do to stop being an accomplice in anticompetitive activity. Interior could change its offshore leasing practices. That could be accomplished fairly quickly.

Also—and I am really speaking out of school here because I know nothing about the internal functions of the Congress—but I don't see why the Congress couldn't eliminate this intrastate regulatory gap that creates a means of leverage by which the interstate prices are jacked to higher levels and creates a motivation for holding off. If you have an unregulated, monopolistic market where you can charge what the market will bear, you might be better off holding your gas for several years and selling it somewhere down the pike at high unregulated rates rather than selling it now at just the reasonable rates in the interstate market. That would be one thing, I think, that would be a definite help.

There are others listed in the conclusions to my testimony.

Mr. NASH. Thank you very much. I have no further questions.

Senator HART. Mr. Chumbris.

Mr. CHUMBRIS. Thank you very much, Mr. Chairman.

I am going to make the same comment to Dr. Wilson that I made to Dr. Schwartz. You made some statements and observations; there are other statements and observations in the record that would take issue with some that you have made, and we will have to let the full record speak for itself.

Dr. WILSON. In addition to opinions, we would be glad to discuss the facts with you, if you wanted to do that, Mr. Chumbris.

Mr. CHUMBRIS. Well, maybe there will be some response from those who testified and you will have an opportunity to make further observations for the record at a later time.

Dr. WILSON. Thank you.

Senator HART. Gentlemen, thank you very much.

We are adjourning to resume in this room tomorrow morning at 10 o'clock.

[Whereupon, at 5:35 p.m., the subcommittee adjourned, to reconvene at 10:15 a.m., Thursday, June 28, 1973, in room 2228, Dirksen Senate Office Building.]

[Dr. Wilson's prepared statement follows. Testimony resumes on p. 505.]

TESTIMONY OF DR. JOHN W. WILSON, CHIEF, DIVISION OF ECONOMIC STUDIES, FEDERAL POWER COMMISSION

I would like to thank the Chairman and Members of this Subcommittee for once again inviting me to appear before you to present testimony on a most important national economic policy matter.

I should, of course, preface my remarks today by indicating that they reflect my own views and analyses and do not represent the views of the Federal Power Commission.

Your invitation requested that I present testimony on the extent of competition in the natural gas producing industry, and it indicated particular interest in the following matters:

1. The extent and degree of concentration.
2. Proposals to deregulate the price of natural gas at the wellhead.
3. The effect on consumers of deregulation.
4. An assessment of why we are experiencing a shortage of natural gas.
5. Policy alternatives to increase supply.

I shall, therefore, in compliance with your request, take up each of these matters in some detail. Before embarking on detailed discussions, however, allow me, at the outset and at the risk of undermining the suspense value of my subsequent presentation, to set forth my fundamental conclusion. That is, the petroleum industry is not, in any economically meaningful sense of the word, either adequately or workably competitive.

I. COMPETITION

The ultimate test of seller competition in any industry or market is whether there is a sufficient number of independent producers in that market to preclude excessive seller influence and control over price, quantity, and the nature of the product provided in the marketplace. There is an absence of adequate competition when, as in the petroleum producing industry, sellers are able to exercise great discretion in establishing prices, supply levels, and other marketing strategies. Where firms have such latitude, they possess excessive market power, and the outcome of such a "free market," much to the detriment of consumers and the public interest, is monopolistic rather than competitive.

Competition, thus defined, focuses upon seller rivalry in the pursuit of consumer satisfaction. This rivalry, though motivated by the seller's desire to expand his sales, serves the public interest in that the seller achieves his private objective by outdoing his rivals in offering a better service or product to consumers. Conversely, it is well known that the only rivalry now prevailing in gas production markets is rivalry between buyers (i.e., who will pay the most for available supplies?) Thus, the producers sit back and play one prospective buyer off against another and call this "competition". The twisted semantics aside, it is quite clear that, whatever name we give it, buyer's rivalry does not foster consumer interests.

II. CONCENTRATION

As shown below, market concentration in the petroleum industry is high. That is significant, but given the institutional setting which we know exists in the industry, it should probably be viewed as an ancillary factual observation. Unfortunately, many of the analysts who have addressed the competition issue treat concentration as being alpha and omega, and then rush headlong to judgment without ever having weighed the critical direct factual evidence bearing upon the industry's institutional framework. Concentration, after all, means virtually nothing in and of itself; it is an important measure only in that it infers something else.

Let me be specific as possible on this point because it is quite critical, and it appears to be the slippery plank where a number of otherwise learned and capable analysts seem to have fallen overboard. As I said just previously, whether or not there is competition depends upon whether there is an adequate number of truly independent, self motivated sellers. *Independence* is the key. Without independence, self motivation will bind interdependent sellers together in the mutual pursuit of common objectives at the expense of consumers. With independence and the vigorous conflict of real competitive rivalry, the market system can serve consumers admirably. Consequently, in attempting to determine whether a market is workably competitive, economists search for evidence bearing upon the presence or absence of seller independence.

Often times, however, good direct evidence on the degree of seller independnce is unavailable, or that which is, is inadequate. Then, of course, it is necessary and appropriate to look for secondary evidence which may have inferential value in assessing the primary issue—information from which one can obtain some insight on the specific question at hand. Information on concentration frequently provides such an insight on the question of seller interdependence in that it provides an analytical base from which probabilistic conclusions can be derived. In other words, concentration serves as a basis for logical conclusions derived via the classical deductive method of logic:

> e.g., in industries dominated by a few large firms, each of the participants is aware of the fact that his actions will affect the others in that industry significantly, and that they, in turn, will react and affect him. They are all interdependent! Vigorous competition will therefore be stifled by their own self-interest in peaceful coexistence.

Or, as stated more elegantly:

> A large concern usually must show a regard for the strength of other large concerns by circumspection in its dealings with them, whereas such caution is usually unnecessary in dealing with small enterprises. The interests of great enterprises are likely to touch at many points, and it would be possible for each to mobilize at any one of those points a considerable aggregate of resources. . . . Hence, there is an incentive to live and let live, to cultivate

> a cooperative spirit, and to recognize priorities of interest in the hope of reciprocal recognition.[1]

Simply put, that is why economists (should) concern themselves with concentration ratios. These ratios are an admirably designed foundation from which deductive logic can proceed. If concentration is high, we deduce that firms are not likely to behave independently, and if they don't behave independently the market will not be competitive.

My point in belaboring this discussion is merely to establish the fact that concentration ratios are particularly important when it is necessary to use deductive logic to determine whether firms are interdependent. If the answer to that question is known directly, then whether the four firm concentration ratio is, say 0.3 or 0.6 is really quite moot.

Perhaps I should apologize for pursuing the obvious as if it were the revelation of some great mystery, for I am aware that no one on this Subcommittee is an economist buried in the quagmire of his own art form. It is quite apparent to anyone who studies the petroleum industry fully and objectively and who has read the academic literature on this subject, that there are some economists who seem quite unable to see the forest for the trees (in some cases, perhaps, mere saplings of their own planting). Thus, there has been a good bit of twiddling with concentration ratios as well as numerous sterile debates about what market specification should be used when calculating them. Much of this jousting has apparently been by analysts who have obliterated from their mind (or at least their mind's eye) what the proper function of a concentration ratio really is in the first place; either that, or they are, as I suggested earlier, rushing to judgment without assuming the burden of acquiring the available pertinent facts. If devotion to art form and tunnel vision are curable in economists, perhaps the factual information presented below will persuade some of the concentration ratio contemplators that by removing one's blinders it is possible to find some "pretty darn good" *direct* evidence, which should at longlast render academic the remaining question of whether conventional forms of deductive logic apply in this case.

III. MEASURING CONCENTRATION

Having stated the obvious: that concentration ratios are an inferential measuring device which should be considered by economic analysts and policy makers particularly in the absence of superior direct evidence, it is nevertheless appropriate to at least address that subject in some detail insofar as so much of the historic academic and policy debate over competition in the petroleum industry has (dead) centered on this point.[2]

Initially, it should be observed that when we address the "natural gas producing industry" we are discussing the "petroleum industry". The dominant firms are the same, and these firms have fully integrated gas and oil producing and marketing operations which can not be analyzed intelligently in isolation. As shown in Table 1, the top 14 natural gas producers in 1970 were also among the top 15 oil and liquids producers and among the top 17 petroleum refiners. These 14 leading gas producers were also among the 17 largest sellers of gasoline and other refined petroleum products and among the 17 largest sellers of natural gas to interstate pipelines.

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[1] Corwin D. Edwards, "Conglomerate Bigness as a Source of Power," 1955.

[2] The obvious redundancy notwithstanding, since I do choose to address the subject here, I feel compelled to reiterate that, in view of the evidence presented in the subsequent sections of this testimony, the ultimate resolution of arguments over what is the appropriate measure of concentration is not really essential to a determination of whether the petroleum industry is or is not competitive. While the concentration measures presented here are indicative of market control as measured by the conventional deductive method, I do not base my conclusions upon them. This technique, at best, provides a circumstantial case.

While it does seem clear to me that this circumstancial evidence points to the same conclusions which I have derived directly from evidence below, I would, nevertheless, welcome further discussion in a non-policy context from those more concerned with the esoterics of concentration ratio methodology than with the essential facts of this particular industry. Improvements in the deductive approach should, of course, be encouraged and pursued because that may be all that we have to go on in anlyzing other markets and industries where direct evidence is less viable.

TABLE 1.—RANKINGS OF LARGEST FIRMS IN THE PETROLEUM INDUSTRY (1970)

Natural gas producers	Oil and gas liquids producers	Petroleum refining	U.S. refined product sales	Natural gas sales to interstate pipelines
1. Exxon	1	1	1	1
2. Texaco	2	2	2	7
3. Amoco	6	6	4	4
4. Gulf	3	5	7	2
5. Phillips	12	11	9	5
6. Mobil	8	3	6	6
7. Shell	4	7	3	3
8. Atlantic-Richfield	7	8	8	8
9. Sun	11	9	10	12
10. Chevron	5	4	5	11
11. Union Oil	9	10	11	9
12. Getty	10	15	17	17
13. Continental	13	14	14	10
14. Cities Service	15	17	13	14

These same companies are the ones which face consumers from the other side of the so called "energy crisis" in all petroleum markets (e.g., natural gas, fuel oil, gasoline), and some of them also hold significant supply positions in the coal and uranium industries. To an economist it is interesting, though not surprising, that the "energy crisis" has not created obvious financial difficulties for these firms. In fact, recent evidence suggests quite the opposite. Many of these companies as well as other firms in the petroleum industry experienced record profit levels in the first quarter of 1973. Table 2 presents information on after tax profits in this most recent quarter as compared with the first quarter of 1972. Every company, without exception, experienced substantial improvement, and the average earnings increase was between 25 and 30 percent.

These are, of course, the same firms which have controlled the bulk of our available hydrocarbon resources in the past, and they are likely to continue to do so in the future. Focussing for the moment on natural gas, much of which is produced jointly in conjunction with the exploration for the development of oil, it is estimated that the top four producers in the major producing areas have generally accounted for 50 percent or more of the new gas sold to interstate pipelines in recent years.

TABLE 2.—PROFIT RECORD OF MAJOR OIL COMPANIES

	Percent annualized return on equity (1st quarter)		Percent change in after tax earnings 1st quarter 1972, 1st quarter 1973
	1972	1973	
Exxon	11.6	16.6	+43.1
Mobil	11.0	12.1	+10.1
Texaco	12.8	14.7	+14.8
Gulf	10.3	12.2	+18.8
Chevron	9.4	11.7	+24.2
Amoco	10.5	12.8	+21.5
Shell	7.4	11.0	+49.2
Continental	10.4	11.6	+11.5
Atlantic	4.4	6.8	+52.2
Phillips	7.8	9.5	+22.1
Occidental	2.7	4.3	+57.8
Union	7.4	9.5	+28.0
Sun	7.9	11.2	+42.3
Cities	8.2	9.6	+17.4
Ashland	12.2	15.2	+[1] 24.8
Sohio	4.4	6.5	+48.8
Signal	5.5	10.1	+85.6
Getty	6.4	9.0	+40.9
Amerada	21.2	26.5	+25.1
Marathon	8.2	12.3	+49.6
Kerr-McGee	7.8	9.3	+20.2
Diamond Shamrock	6.3	11.5	+83.0
Universal	8.5	17.1	+101.2
Commonwealth	5.8	6.5	+13.4
American Petrofina	6.3	12.9	+105.1
Clark	3.9	23.5	+502.0
Average	9.8	12.6	+28.7

[1] Based on the period of 6 months as reported in Moodys. The Oil and Gas Journal, May 14, 1973, reported Ashland's 1st quarter 1973 earnings as +40.7 percent.

The top 8 have accounted for over 60 percent (and, more often than not, for 80 percent or more) of annual new commitments. These estimates and an explanation of how they were calculated are presented in Table 3.

As indicated above, concentration ratios such as these have frequently been used as partial indicators of market power in studies of industry structure. A familiar rule of thumb is that in industries where the eight largest firms have at least 50 percent of the sales, normal unrestrained market forces are likely to be an insufficient guarantee against monopolistic market performance.[3]

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[3] See, for example, Carl Kaysen and Donald F. Turner, *Antitrust Policy: An Economic and Legal Analysis,* (Cambridge: Harvard University Press), 1965.

TABLE 3.—CONCENTRATION OF NEW (NON ET AL.) GAS CONTRACT VOLUMES SOLD TO INTERSTATE PIPELINES (1965–70)[1]

	Percent	
	4 largest	8 largest
South Louisiana:		
1965	52.1	68.9
1966	63.8	82.6
1967	76.9	86.2
1968	51.6	68.9
1969	41.6	60.9
1970	41.1	68.1
Permian Basin:		
1965	67.0	88.8
1966	89.0	94.3
1967	61.7	76.0
1968	76.5	84.7
1969	52.4	81.1
1970	66.8	82.7
Texas Gulf Coast:		
1965	86.9	92.3
1966	95.9	98.9
1967	71.3	89.5
1968	83.7	98.6
1969	43.9	71.9
1970	64.9	74.2

[1] Ratios calculated on the basis of natural gas volumes sold to interstate pipelines under non et al. vintage year contracts in the 1st full year of sales following the vintage contract year. Thus, the 1970 concentration ratios are based on actual annual volumes in 1970 from new non et al. contracts culminated during 1969. The ratios are calculated by dividing the non et al. volumes accounted for by the 4 and 8 largest producers, respectively, in each year by total non et al. volumes. The implicit assumption in this calculation is that these producers shared proportionally in volumes sold under et al. contracts. None et al. contracts generally accounted for over 75 percent of the total annual volume. To the extent that the largest firms had either a disproportionally large share of the et al. volumes, or a disproportionally small share, the actual concentration ratios would be either slightly higher or lower. In any event, the ratios reported here tend to underestimate actual concentration to some extent as they do not take account of all corporate affiliations (e.g., Getty, Skelly, and Tidewater are treated independently although all were controlled by Getty).

The 8-firm concentration ratios in Table 3 are, of course, far above the 50 percent level, but there are industry spokesmen and consultants who have challenged the theoretical basis upon which these are calculated. Foremost among the critics are those who would rather calculate concentration ratios on the basis of "flowing gas". That is, these industry spokesmen suggest, one should endeavor to measure the percent attributable to the top firms on the basis of total annual volumes flowing out of the ground. Quite obviously, as a market structure test, that is absurd. Most flowing gas was contracted for (in effect, sold) years ago, and therefore has no relevance at all with respect to supply conditions facing prospective buyers in today's markets. What is relevant to objective market analysis is what buyers are confronted with at the time when they are contracting for new gas commitments. In other words, meaningful analysis should focus on uncommitted gas reserves; these are the supplies available to buyers when purchase decisions are made.

The new gas concentration ratios presented in Table 3 may in fact be an underestimate of actual market control. First, these ratios are based on new gas commitments over the period of a full year. Under present circumstances it seems doubtful that an interstate pipeline which has decided that it needs new reserves will be able to play one producer off against another for anything near twelve months. Since there is no evidence to suggest that producers now have to go begging for buyers over lengthy periods of time, accessible gas that was for sale at the beginning of the year is, in all probability, sold within much less time than a full year.

Incredibly there are those who attempt to argue that because pipelines in the past quite naturally contracted for large blocks of gas at irregular intervals as major new pipeline capacity was built (say, over 3–5 year intervals), concentration ratios should now be calculated on the basis of gas sales over similar 3–5 year periods. Such an obvious nonsequitur is a flimsy attempt to distort the data, and accordingly should be dismissed out of hand. Today's supply situation does not center around the massing of large periodic gas bundles to sustain new major interstate pipeline construction nor are sellers of new supplies hard pressed over long periods to find buyers. And, finally, the buyers themselves are not in a position to sit by in tranquil contemplation of market offerings for three years or more. In short, the argument has no relevance.

A second reason for suggesting that the ratios in Table 3 may be an underestimate of actual concentration is that they are based on calculations which treat each vintage gas contract as though it were an individual unrelated transaction. That is frequently not the case. For example, it has been shown in various proceedings before the FPC that even though separate contracts are involved, pipelines have often entered into these contracts simultaneously and in identical fashion with a large number of producers in a specific field. Often the sellers merely own joint interests in the same lease or leases from which the gas is produced. The concentration ratios in Table 3 do not take account of that, but rather treat each contract as an individual competitive transaction.

TABLE 4.—CONCENTRATION OF THE AVAILABLE NEW GAS SUPPLIES AS OF DEC. 31, 1971 AND JUNE 30, 1972 [1]

[Percentage of reported uncommitted reserves controlled by 4 and 8 largest producers] [2]

Producing area	Dec. 31, 1971		June 30, 1972	
	4 largest	8 largest	4 largest	8 largest
Permian Basin	63.6	86.4	80.6	94.2
Hugoton Anadarko	76.6	94.5	62.6	83.3
Other Southwest	93.3	98.6	94.4	99.3
South Louisiana: [3]				
Onshore	96.9	99.6	92.3	98.4
Offshore (Federal)	57.0	83.3	49.6	74.9
Offshore (State)	84.5	100.0	94.9	100.0
Texas gulf coast: [4]				
Onshore	89.4	96.7	84.4	92.4
Offshore (Federal)	98.5	100.0	100.0	100.0
Offshore (State)	100.0	100.0	100.0	100.0
Rocky Mountain	63.4	82.9	70.4	86.0
Appalachian	99.6	100.0	100.0	100.0
Unclassified:				
Michigan	100.0	100.0		
California	95.4	100.0	94.3	100.0
Miscellaneous	87.7	99.9	98.0	100.0
Alaska [5]	93.9	99.9	93.9	99.9
Total United States [5]	51.4	75.9	51.0	73.9

[1] Concentration ratios are based on individual company reserve reports. To the extent that 2 or more companies report pro rata ownership shares of jointly held leases for which there is a single operation, the concentration ratios tend to underestimate the actual degree of seller concentration.

[2] Reports were obtained from 79 large producers. These producers provide most of the gas sold to interstate pipelines (e.g., in 1971 the top 22 supplied over 70 percent of all interstate gas). Nevertheless, to the extent that nonreporting small producers may have had significant volumes, the ratios reported here tend to slightly overstate actual market concentration.

[3] Combined concentration ratios for the south Louisiana area are not available. Onshore represents 44 percent of the total, offshore (Federal) 53 percent, and offshore (State) 3 percent.

[4] Combined concentration ratios for the Texas gulf coast area are not available. Onshore represents 47 percent of the total, offshore (Federal) 51 percent, and offshore (State) 2 percent.

[5] Does not include 26,000,000,000,000 ft^3 in North Slope reserves reported in the aggragate for all companies by 1 producer.

Perhaps a better impression of actual concentration can be obtained from Table 4. The four firm and eight firm ratios shown there are based on an actual survey by the FPC of available uncommitted gas supplies as of December 31, 1971 and June 30, 1972. These ratios are extremely high, and they tend to be rather stable from one period to the other. Some qualifications pertaining to these data are noted in the footnote to the table. In particular, it should be noted that these volumes represent only statements that producers have made for the record. Of course, if reserve estimates are understated (or overstated) and if everyone has a proportional propensity to be cautious (or overly optimistic), the ratios would remain the same. Also, it should be observed that these reports were filed by only 79 large producers. While this group has always accounted for the great bulk of gas sales, it is not unreasonable to speculate that nonreporting producers may have had some available supplies. If that was the case, concentration tends to be somewhat overstated here.

In addition to the very high regional concentration reported in Table 4, it is also noteworthy that the national 4 and 8 firm ratios are about 50% and 75%, respectively. It has been urged by some industry advocates that because certain large interstate pipelines reach into more than one producing area, multi-area or national concentration ratios should be relied upon. This, too, appears to be little more than a special pleader's manifestation of the producers' desire to present an unrealistically low estimate of concentration. If, let us say, a pipeline company serving the Northeast has two lines, one going to the South Louisiana Area and another to the Permian Basin and it needs additional volumes to bring the South Louisiana line up to capacity, then South Louisiana is the only relevant supply market. It is true that in the past, when the interstate pipeline network was being established, prospective pipeline builders may have had a great deal of flexibility in choosing between certain producing areas, but now, with the lines already built, their flexibility is obviously diminished. Nevertheless, because there are some situations where particular pipelines may have legitimate alternative sources in more than one producing region, it is instructive to note that even on a nationwide basis available uncommitted reserves appear to be highly concentrated.

Also, the evidnce presented in Table 5 demonstrates that concentration appears to be quite high even in a prospective sense. Over 80 percent of the federal offshore leases acquired (weighted by bonus dollars paid) in each of three recent lease sales were accounted for by the top eight bidders and their bidding partners.[4] In all three sales combined, the top eight accounted for 70 percent of the successful bids. As shown below, these bidding partnerships generally become producing partnerships, and consequently future prospects, for our offshore areas at any rate, are for continued high levels of supply concentration.

Finally, it is also noteworthy that mergers and acquisitions during the last two decades suggest that concentration is increasing over time. A listing of major petroleum industry mergers (i.e., involving firms with assets of $10 million or more) is presented in Table 6. Since 1960 alone, there have been more than 50 major acquisitions, a number of them involving the merger of two fully integrated majors, each representing hundreds of millions of dollars of assets. At the same time, no new fully integrated majors have etnered the market during the last decade.

TABLE 5.—*Concentration ratios for offshore lease acquisition*[1]

	Percent
Dec. 15, 1970:	
Largest buyer (and affiliates)	16.2
Top 4 (and affiliates)	53.7
Top 8 (and affiliates)	82.9
Sept. 12, 1972 sale:	
Largest buyer (and affiliates)	42.8
Top 4 (and affiliates)	85.6
Top 8 (and affiliates)	96.0
Dec. 19, 1972 sale:	
Largest buyer (and affiliates)	13.8
Top 4 (and affiliates)	48.5
Top 8 (and affiliates)	81.6
All 3 sales combined:	
Largest buyer (and affiliates)	14.9
Top 4 (and affiliates)	42.8
Top 8 (and affiliates)	69.9

[1] Ratios calculated on the basis of bonus dollars paid by the largest buyer, four largest, or eight largest buyers, as a percentage of total bonus bids paid by all buyers. "And affiliates" means that the total includes the bonus dollars paid by affiliates where they bid jointly with the primary firm. Thus, *the ratio represents the percentage of acquisitions* (as measured in terms of bonus dollars paid) *in which the largest buyers hold either a full or part interest.*

Not only have the dominant majors been free from the threat of new entry, but, except for merger, there has been relative stability in the makeup of the top firms in the industry. In 1971, the ten leading interstate natural gas suppliers were: Exxon, Amoco, Shell, Gulf, Phillips, Mobil, Texaco, Union Oil, Atlantic Richfield, and Continental. The first eight of these were also among the top 9 producers fifteen years earlier, and the two new entrants into the top ten, Atlantic Richfield and Continental, attained entry via merger—Atlantic by acquiring Richfield and Sinclar, and Continental through a variety of acquisitions.

In summary, then, virtually any reasonable measure of seller concentration in natural gas markets suggests that there is a substantial degree of dominance by the large producers. The only remaining question then is: Even if that is so, is this not also a characteristic of some other unregulated industries in our economy (e.g., automobiles, copper, computers, etc.), and if so, why worry about petroleum any more than the others?

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[4] Lease sales in December, 1970; September, 1972; and December, 1972.

The direct evidence, which goes well beyond the probabilistic implications of concetnration ratios, and the institutional reasons as to why the petroleum industry is, in fact, set apart from the others, is the subject of the following section of my testimony.

TABLE 6.—RECENT MAJOR PETROLEUM INDUSTRY MERGERS

Date	Acquiring company	Assets (millions)	Acquired company	Assets (millions)
1949	Union Oil Co	$298. 4	Los Nietos Co.[1]	$13. 3
1950	Sunray Oil Co	131. 4	Barnsdall Oil Co	87. 2
1954	Chicago Corp	46. 9	Champlin Refining	
1954	General American Oil [1]	36. 0	Deep Rock Oil [1 2]	
1954	Monterey Oil Co.[1]	33. 1	Fullerton Oil [1]	23. 7
1955	Sinclair Oil	1, 186. 8	Am. Republics Corp	41. 2
1955	Tennessee Gas Trans.[3]	742. 5	Bay Petroleum Corp	29. 6
1955	Kerr McGee Oil	43. 3	Deep Rock Oil Corp.[2]	12. 0
1955	Monsanto Chemical [4]	376. 5	Lion Oil Co	147. 6
1955	Sunray Oil Co	300. 0	Mid-Continent Petroleum	186. 3
1955	Delhi Oil Corp.[1]	21. 8	Taylor Oil & Gas	36. 5
1956	Atlantic Refining	611. 6	Houston Oil of Texas [1]	77. 5
1956	American Petrofina	57. 1	Panhandle Oil	15. 7
1956	Sinclair Oil	1, 250. 1	So. Production Co	77. 4
1956	Standard Oil of Indiana	2, 332. 4	Utah Oil Refinery	54. 6
1956	Gulf Oil Corp	2, 160. 8	Warren Petroleum	163. 9
1958	Mobil Oil	3, 105. 3	Freeport Sulphur [2]	100. 0
1958	Signal Oil & Gas [1]	128. 0	Hancock Oil Co	62. 7
1958	Tennessee Gas Trans.[3]	1, 096. 8	Middle States Petroleum [1]	29. 4
1958	Texaco	2, 729. 1	Seaboard Oil [1]	93. 1
1959	Signal Oil & Gas [1]	210. 0	Bankline Oil Co	13. 2
1959	Continental Oil	619. 7	International Refineries	12. 1
1959	do	619. 7	Kewanee Oil [1 2]	
1959	do	619. 7	San Jacinto Petroleum [1]	35. 6
1959	Sunray Mid-Continent	540. 8	Suntide Refinery	41. 9
1960	W. R. Grace Co.[4]	529. 6	Cosden Petroleum	67. 0
1960	Standard of New Jersey	9, 894. 7	Monterey Oil [1]	102. 2
1960	Union Oil & Gas [1]	63. 3	Texas Natural Gasoline [1]	52. 3
1960	Pure Oil Co	552. 9	Woodley Petroleum [1]	30. 1
1970	Continental Oil	832. 5	Douglas Oil Co	18. 2
1961	Cities Service	1, 342. 6	Felmont Petroleum [1 2]	
1961	Standard of Indiana	2, 925. 7	Honolulu Oil [1]	99. 2
1961	Murphy Corp. [1]	120. 6	Ingram Oil & Refinery	14. 8
1961	Standard of California	2, 782. 3	Standard of Kentucky	141. 9
1961	Delhi Taylor Oil	71. 5	Three States Nat.[1]	18. 9
1962	Cities Service	1, 405. 7	Columbian Carbon [4]	88. 9
1962	Standard of New Jersey	10, 494. 4	Olin Oil & Gas	57. 0
1962	Marathon Oil	469. 9	Plymouth Oil Co	80. 8
1962	Texaco	3, 646. 7	T.X.L. Oil [1]	36. 7
1962	Consolidated Oil & Gas [1]	4. 9	Tekoil Corp.[1]	12. 4
1962	Union Oil of California	761. 5	Tex. Nat. Petrol. Co.[1]	37. 0
1962	Sinclair Oil	1, 507. 2	Texas Butadiene	42. 7
1962	Allied Chemical [4]	800. 8	Union Texas Nat. Gas [1]	165. 2
1963	Continental Oil	1, 241. 1	Cities Service Gas [1 2]	
1963	American Petrofina	89. 8	Cosden Petr./Grace [2]	73. 9
1963	Sinclair Oil	1, 515. 3	Drill & Explor. Co.[1]	19. 5
1963	Sunset International [1]	47. 7	Sunoc Petrol.[1]	12. 3
1963	Sinclair Oil	1, 515. 3	West Nat. Gas [1]	76. 4
1964	Livingston Oil [1]	19. 1	Crescent Oil [1]	
1964	Continental Oil	1, 462. 8	Delhi Taylor Oil [1 2]	52. 4
1964	Tennessee Gas Tran..[3]	2, 234. 2	Delhi Taylor Oil [1 2]	52. 4
1964	Shell Oil Co	2, 138. 8	El Paso Natural Gas [2]	
1964	Standard of Indiana	3, 206. 6	Midwest Oil Corp.[1]	62. 7
1964	Mobil	4, 659. 5	Northern Nat. Gas Prod.[1 2]	
1964	Sinclair	1, 618. 9	Texas Gulf Prod. Co.[1]	69. 7
1964	Tennessee Gas Trans.[3]	2, 234. 2	Wilcox Oil Co	13. 7
1965	Panhandle Eastern [3]	407. 9	Ambassador Oil Corp.[1]	28. 8
1965	Union Oil of California	916. 5	Pure Oil	766. 1
1966	Husky Oil	112. 2	International Oil & Gas [1]	11. 8
1966	Witco Chemical [4]	93. 1	Kendall Refining	21. 9
1966	Sinclair Oil	1, 694. 5	Barber Oil [1 2]	
1966	Atlantic Refining	960. 4	Richfield Oil	499. 6
1966	Phillips Petroleum	2, 029. 1	Tidewater Oil [2]	372. 8
1967	Getty Oil Co		Tidewater Oil Co	
1967	Husky Oil	141. 5	Frontier Refinery	41. 2
1967	Tenneco Corp	1, 252. 3	Kern County Land [1]	706. 4
1967	Diamond Alkalai [4]	275. 6	Shamrock Oil & Gas	173. 7
1968	Panoil Co.[1]	21. 3	Dorchester Gas Prod.[1]	14. 7
1968	Sun Oil Co	1, 598. 5	Sunray DX Oil Co	749. 0
1968	Intex Oil Co.[1]	5. 8	Tesoro Petroleum (Texas) [1]	12. 3

TABLE 6.—RECENT MAJOR PETROLEUM INDUSTRY MERGERS—Continued

Date	Acquiring company	Assets (millions)	Acquired company	Assets (millions)
1965	Swift & Co.[4]	757.8	Bell Oil & Gas	$18.6
1969	Amerada Petroleum	471.1	Hess Oil	491.5
1969	Mesa Petroleum	14.5	Hugoton Prod.[1]	14.3
1969	Ashland Oil	846.4	Midhurst Oil [1]	14.7
1969	Atlantic-Richfield	2,450.9	Sinclair Oil	1,851.3
1970	Standard of Ohio	772.7	British Petroleum Corp.[2]	627.3
1970	French Petroleum Can.[1]		Leonard Refineries	56.1
1970	Ashland Oil	846.4	Northwestern Refinery	60.1
1970	Wiser Oil [1]	6.4	Petroleum Explor.[1]	21.4
1970	Swift & Co.[4]	744.1	Transocean Oil [1]	47.3

[1] Primarily a producer. Firms without footnotes are integrated refiners.

[2] Partial acquisition involving less than 100 percent of acquired firms total assets.

[3] Interstate gas pipeline company.

[4] Firm classified as being primarily in another industry (i.e., major business is not petroleum production or refining).

Source: Federal Trade Commission, "Large Mergers in Manufacturing and Mining 1948–71."

IV. JOINT VENTURES, INTERTIES, AND INTERLOCKS

There is substantial direct evidence of mutual interdependence between virtually all of the major firms in the petroleum industry. This interdependence includes joint ventures, interlocks, and institutional interties in the following general areas of activity:

1. Joint lease acquisition (bidding combines).
2. Banking interlocks (directorates and common stock ownership).
3. Joint ownership of pipelines and gathering systems.
4. Joint ownership and production from oil and gas leases.
5. International joint ventures.
6. Vertical relationships between the producing, transporting, processing, and marketing sectors of the industry.

Bidding Combines

In any given sale, it is obvious that when four firms such as the CATC group, each able to bid independently, combine to submit a single bid, three interested, potential bidders have been eliminated; i.e., the combination has restrained trade. This situation does not differ materially from one of explicit collusion in which four firms meet in advance of a given sale and decide who among them should bid (which three should refrain from bidding) for specific leases and, instead of competing among themselves, attempt to rotate the winning bids. The principal difference is that explicit collusion is illegal." (Walter Mead, "The Competitive Significance of Joint Ventures," *Antitrust Bulletin*, Fall, 1967, p. 839; quoted in the Federal Power Commission Staff's Reply Brief in Belco Petroleum Corporation, *et al.*, Docket No. CI73–293, *et al.*, April 20, 1973).

The logic of this observation is unexceptionable, and though it was made some six years ago, the situation which it describes has grown substantially since then so that today bidding combines tend to dominate even the acquisition of federal offshore leases. Table 7 lists the major bidding combines which participated in federal offshore lease sales in 1970 and 1972. Because various majors belonged to two or more of these combines, the web of interdependence is far more pervasive than the membership of any single combine would suggest. Figure 1 illustrates some of the interties that exist between the individual combines.

Virtually the only major firm which has maintained its independence in bidding for federal offshore leases is Exxon.[5] The statistics reported in Table 8 suggest that Sun Oil also bids independently, but in fact Sun has actually submitted bids under its own name in behalf of a consortium including Clark Oil, Diamond Shamrock, and the Anadarko Production Co., a subsidiary of Panhandle Eastern.[6]

TABLE 7.—*Major bidding combines which participated in recent Federal offshore lease sales*

1. Tenneco,[1] Texaco
2. Cities Service, Tenneco,[1] Continental
3. Atlantic Richfield, Cities Service,[1] Continental, Getty
4. Phillips, Skelly (Getty), Allied Chemical, American Petrofina
5. Getty, Placid, Superior
6. Superior, Placid, Hunt, Transocean,[1] Ashland
7. Superior, Chevron, Murphy, Pelto,[2] General American
8. Chevron, Mobil, Pennzoil[1]
9. Chevron, Mesa, Burmah[2]
10. Mobil, Gulf, Pennzoil[1]
11. Mobil, Gulf, Chevron
12. Ashland, Mesa, Pennzoil[1]
13. Mobil, Burmah,[2] Mesa, Pennzoil[1]
14. General American, Burmah,[2] CNG[1]
15. Burmah,[2] General American
16. Amoco, CNG,[1] Shell, Transco[1]
17. Amoco, Union, Texas Eastern[1]
18. Amoco, Southern Natural,[1] Champlin
19. Texas Gas,[1] Union, Florida Gas[1]
20. Signal, La. Land, Amerada, Marathon, Texas Eastern[1]
21. Shell, Florida Gas[1]

[1] An affiliate of a major interstate gas pipeline company.

[2] It is interesting to note that Standard Oil of Ohio (Sohio) which also owns the B.P. Corporation, and which is one of the largest holders of petroleum leases in North America, does not participate in federal offshore lease sales. An investigation of this seemingly curious phenomenon revealed the following: Pelto Oil and Southdown-Burmah are both subsidiaries of the Burmah Oil Company which is incorporated in Scotland. Burmah, in turn, owns approximately 25 percent of the common equity of B.P. Ltd., the international giant, and B.P., Ltd. controls Standard Oil of Ohio which is the parent of B.P. Corporation.

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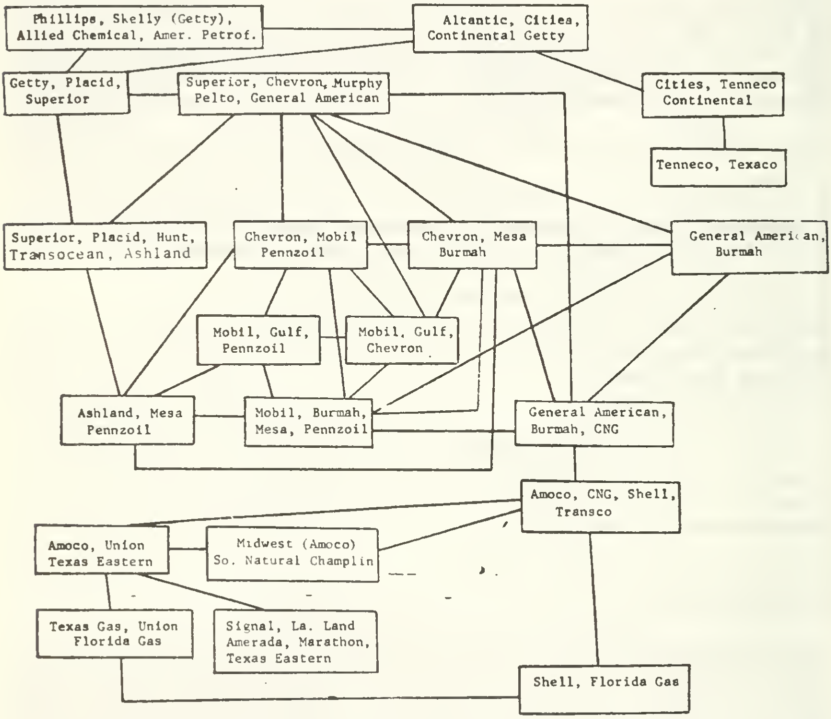
[5] Exxon, of course, is involved in hundreds of joint ventures, involving all of these companies in other endeavors.

[6] As shown in Table 12, Sun owns *all* of its offshore producing leases jointly with other firms.

Figure 1

OFFSHORE BIDDING COMBINES


Phillips, Skelly (Getty), Allied Chemical, Amer. Petrof.
Altantic, Cities, Continental Getty
Getty, Placid, Superior
Superior, Chevron, Murphy Pelto, General American
Cities, Tenneco Continental
Tenneco, Texaco
Superior, Placid, Hunt, Transocean, Ashland
Chevron, Mobil Pennzoil
Chevron, Mesa Burmah
General American, Burmah
Mobil, Gulf, Pennzoil
Mobil, Gulf, Chevron
Ashland, Mesa Pennzoil
Mobil, Burmah, Mesa, Pennzoil
General American, Burmah, CNG
Amoco, CNG, Shell, Transco
Amoco, Union Texas Eastern
Midwest (Amoco) So. Natural Champlin
Texas Gas, Union Florida Gas
Signal, La. Land Amerada, Marathon, Texas Eastern
Shell, Florida Gas

Oil industry spokesman, in the past, have pointed to rivalry in lease acquisition as alleged evidence of competition in the petroleum industry. That is, quite clearly, a *very* weak argument, at best. Consumers can take little comfort from the fact that leases are obtained in an auction market, if there is not adequate competition in the sale of final products. As students of antitrust law will recall, tobacco auctions did not guarantee competition between cigarette manufactures. Similarly, the fact that Alcoa, in the years prior to World War II, was willing to outbid all comers for bauxite deposits hardly served consumer interests. Indeed, even today it can be fairly argued that firms like AT&T, Consolidated Edison, General Motors, and IBM compete vigorously in capital markets and in labor markets for managerial talent and technical expertise, and that they do engage in various types of rivalry with other firms in product development activities. But competition between two communications firms in factor markets for capital and talented manpower or between two electric utilities for limited low sulphur coal supplies is, as everyone knows, no assurance of workable competition in end product markets.

TABLE 8.—JOINT BIDDING IN FEDERAL OFFSHORE LEASE SALES (1970–72)

Company	Number of independent bids	Bidding partners	Number of joint bids with each
Amerada-Hess	0	Signal	50
		Louisiana Land	51
		Marathon	51
		Texas Eastern	16
Amoco	6	Texas Eastern	117
		Union	96
		CNG	79
		Transco	15
		Shell	14
Atlantic-Richfield	12	Cities	106
		Getty	73
		Continental	114
Chevron	79	Mobil	25
		Murphy	17
		General American	17
		Pennzoil	12
		Pelto	13
		Superior	9
		Gulf	7
		Burmah	4
		Mesa	4
Cities Service	7	Atlantic	106
		Getty	100
		Continental	163
		Tenneco	3
Continental	27	Atlantic	114
		Cities	163
		Getty	102
		Tenneco	5
Exxon	80		
Getty	0	Atlantic	73
		Cities	100
		Continental	102
		Placid	4
		Superior	2
Gulf	17	Mobil	17
		Pennzoil	8
		Standard Oil of California (Chevron)	7
Marathon	24	Signal	65
		Louisiana Land	69
		Amerada	51
		Texas Eastern	29
Mobil	8	Pennzoil	30
		Standard Oil of California (Chevron)	25
		Mesa	16
		Burmah	13
		Gulf	17
		Ashland	2
Phillips	0	Skelly (Getty)	69
		Allied Chemicals	66
		American Petrofina	34
Shell	59	Transco	47
		CNG	15
		Standard Oil of Indiana (Amoco)	14
		Florida Gas	17
Sun	115	Pennzoil	2
Texaco	15	Tenneco	32
Union	0	Amoco	96
		Texas Eastern	96
		Texas Gas	48
		Florida Gas	5

As for arguments alleging a procompetitive effect emanating from federal offshore lease sales, there is even less appeal. As indicated at the outset of this section, there is little or no substantive economic difference between the end result obtained from the formation of a bidding combine and the end result of a conspiratorial agreement between oil companies to rotate bids. Legal authorities would have to be relied upon for cogent reasons as to why the former is warmly embraced by the Interior Department while the latter is viewed as a per se violation of Section 1 of the Sherman Act by the Justive Department.

My own view is that the offshore leasing program, as currently administered by the Interior Department, has become one of the most onerous anticompetitive cartelization devices at work in our domestic gas producing industry. Not only is it a vehicle for further joint ventures and the integration of intercorporate interests, it has also become an effective entry blockade for all but the very largest firms in the industry. As the president of an established oil company with annual revenues of over $100 million recently testified in an FPC hearing, it would now take a consortium of 15 or more firms like his to surmount the offshore entry barriers which have been erected under Interior's watchful eye. Consequently, his company and others like it have been effectively precluded from entering these producing areas except by obtaining limited farmouts of unwanted acreage from the dominant majors or perhaps by joining one of the established combines as a junior partner. Neither is likely to have much of a procompetitive effect, and that is most critical because our Federal domain contains a large portion of our nation's remaining oil and gas reserves.

Table 9 lists potential U.S. onshore and offshore petroleum reserves. Total estimated potential offshore natural gas reserves alone are equal to more than 100 times current U.S. annual gas production. Some of these reserves will, of course, require technological advances in order to be economically recoverable. It should be noted, however, that as of 1970, total onshore and offshore "proved reserves"[7] plus estimated unproved natural gas reserves, which are recoverable under present technological and economic conditions, were equal to about six times as much natural gas as has been produced in our entire history or nearly 100 times our current annual consumption.

In summary then, our future production potential is great. While steps should be taken to encourage efficient production at optimal rates, it is also true that the public has an immense interest in assuring that these reserves, especially those on Federal lands, are produced at just and reasonable prices.

TABLE 9.—U.S. POTENTIAL RESOURCES OF PETROLEUM[1]

[As of Dec. 31, 1970]

	Onshore			Offshore		
	Gas	Oil	NGL	Gas	Oil	NGL
Past production	376	89	13	17	4	----------
Proved reserves remaining	252	34	7	39	5	1
Additional reserves recoverable under current technological and economic conditions	1,213	246	31	844	171	26
Additional potential reserves considered paramarginal and submarginal under current economic conditions	1,840	1,100	55	2,490	1,180	77
Total	3,680	1,470	105	3,390	1,360	105
Percent produced through Dec. 31, 1970	10.2	6.0	12.4	.5	.3	0
Percent of reserves remaining as of Dec. 31, 1970	89.8	94.0	87.6	99.5	99.7	100.0

[1] Oil and natural gas liquids (NGL) in billions of barrels; natural gas in trillions of cubic feet.

Source: U.S. Department of the Interior, Geological Survey; Administrative Report, Natural Gas Resources of the United States and the World, pt. I—United States, Prepared by the Geological Survey for the National Gas Survey, Federal Power Commission.

Banking Interlocks

It is illegal under Section 8 of the Clayton Act for one person to serve on the boards of two companies that produce the same goods or services. Literally interpreted, this prohibition apparently does not prevent two persons who work for and represent the same individual or corporation from serving on the respective boards of two competing companies. Thus, a large firm in the financial community could assign two of its vice presidents to serve as directors for two different oil companies. For example, the most recently available evidence on corporate directors from the banking community shows that, as of 1968, Morgan Guaranty and Trust Co. of New York had its employees serving as directors on the boards of Continental Oil, Cities Service, Atlantic Richfield, Belco Petroleum, Columbia Gas, Louisiana Land and Exploration Co., and Texas Gulf Sulfur.[8] Continental Illinois National Bank and Trust had directors with Union Oil, Continental Oil, Amoco, Northern Natural Gas, and others, including major coal companies which have been merged recently with Continental Oil and Standard Oil of Ohio.[9]

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[7] "Proved reserves," as generally defined, can be likened to a retailer's "shelf stock." They are reserves that have actually been drilled and are ready to flow. They do not include highly probable quantities of gas that have not yet been drilled, and they are, therefore, an insufficient measure of our economically recoverable resource base. Indeed, if a producer does not intend to sell his resource until prices have attained some anticipated level in the future, it would simply be bad business to sink capital into development and production facilities and bear the contingent carrying charges long before sales take place.

In addition, banks and their trust departments often own substantial amounts of the common stock of rival firms in the same industry. For example, in 1968, Boston's State Street Bank & Trust Co., owned 15 percent of the common stock of Texas Oil and Gas, 6.3 percent of the common in Amerada Petroleum, 11.6 percent of the common in Zapata Offshore, 10.1 percent of Kerr McGee, 7.7 percent of Pennzoil, and 7.6 percent of Newmont.

A listing of certain interlocking directorates in the petroleum industry by major banks, as of 1968, is provided in Table 10. This situation is a threat to effective competition among these pertoleum companies not only because the interlocks create a commonality between their boards, but even more so because of the critical role of the financial community in providing the capital which will be needed to expand energy production to meet future needs. Simply put, vigorous economic competition would be better served if the same banks were not represented on the boards of rival companies.

TABLE 10.—*Bank director interlocks between major firms in the petroleum industry (1968)*

La. Land and Exploration Co. Belco Petroleum Corp. Texas Gulf Sulphur* Continental Oil Cities Service Co. Atlantic Richfield Columbia Gas System	Morgan Guaranty Trust Co.[1]
Allied Chemical Monsanto Co. W. R. Grace Co. Standard Oil of N.J. Mobil Oil Sinclair Oil	First National City Bank[2]
Standard Oil of N.J. Standard Oil of Ind.	Chase Manhattan[3]
Swift & Co.[5] Shell Oil Co. Standard Oil of Ind.*	First National Bank of Chicago[4]
Consolidation Coal[6] Old Ben Coal Corp.[7] Swift & Co.[5] FMC Corp. Standard Oil of Ind. Continental Oil Union Oil of Calif. Northern Natural Gas Co.	Continental Illinois National Bank & Trust Co.[8]
Cabot Corp. Mobil Oil	First National Bank of Boston
Diamond Alkali Texaco, Inc. Marathon Oil Standard Oil of Ohio* Consolidated Natural Gas	National City Bank (Cleveland)

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[8] Morgan also held substantial stock interests in Texas Eastern Transmission Corp., and Panhandle Eastern Pipeline Co., as well as numerous gas distribution utilities.

[9] This bank also owned 5.2 percent of the common stock in Coastal States Gas Producing Co.

TABLE 10.—*Bank director interlocks between firms in the petroleum industry (1968)*—Continued

Cabot Corp.	State Street Bank & Trust Co. (Boston)[9]
Consolidation Coal Co. Union Carbide Diamond Alkalai Columbia Gas System	Melon National Bank (Pittsburgh)
Canadian Export Gas & Oil Ltd. Union Carbide Mobil Oil Continental Oil	Bankers Trust Co.
General Crude Oil Co. Texas Gulf Sulphur Union Carbide W. R. Grace Co.	Manufacturers Hanover Trust
Amerada Petroleum Freeport Sulphur Co. Texaco, Inc. Cities Service Co. Texas Gas Transmission Co.	Chemical Bank[10]
Consolidation Coal Co. Sunray DX Oil Co. Consolidated Natural Gas Co. Texas Gas Transmission Co.	Pittsburgh National Bank
Swift & Co. Union Carbide Union Oil of California	Northern Trust Co. (Chicago)
Swift & Co. Standard Oil of Indiana Natural Gas Pipeline Co.	Harris Trust & Savings Bank
Standard Oil of Indiana Natural Gas Pipeline Co.	American National Bank (Chicago)
Canadian Delhi Oil, Ltd. Diamond Alkalai Co. Standard Oil of Ohio	Central National Bank (Cleveland)

[1] In addition to these companies whose Boards have one or more directors from Morgan, the bank also owns substantial stock interests in *Texas Eastern Transmission Corp., Panhandle Eastern Pipeline Co.,* and numerous gas distribution utilities.

[2] In addition to these companies whose Boards have one or more directors from First National City, the bank also owns substantial stock interests in *Panoil Co., Phillips Petroleum, Panhandle Eastern Pipeline Co., Tenneco, Inc.,* and numerous gas distribution utilities.

[3] Chase also owned 5.6% of the common stock in *Panhandle Eastern Pipeline Co.*

[4] First National of Chicago also held substantial stock interests in a large number of gas distribution companies.

[5] Swift & Co. has several subsidiaries in the oil industry.

[6] Consolidation is a subsidiary of *Continental Oil.*

[7] Old Ben is a subsidiary of *Standard Oil of Ohio.*

[8] Continental Illinois also owned 5.2% of the common stock in *Coastal States Gas Producing Co.*

[9] State Street Bank also owned 15 percent of the common stock in *Texas Oil and Gas,* 6.3% of the common in *Amerada Petroleum,* 11.6% of the common in *Zapata Offshore Co.,* 10.1% of the common in *Kerr McGee,* 7.7% of the common stock in *Pennzoil,* and 7.6% of the common in *Newmont Mining Co.*

[10] In addition, the Chemical Bank owned a substantial stock interest in the *Hugoton Production Company.*

*The bank specified also owns a substantial equity interest in this oil company.

Source: *Commercial Banks and their Trust Activities,* Staff Report for the Subcommittee on Domestic Finance, Committee on Banking and Currency, House of Representatives, 90th Congress, 2d Session, July 8, 1968.

Joint Ownership of Oil Pipelines

Virtually all of the major integrated petroleum companies hold joint interest with others in the transportation network that moves crude oil and products from producing regions to refineries and markets. A number of these joint ventures and the participants in each are listed in Table 11.

It is well known that the control of crude oil pipelines by the Standard Oil Trust was a key link in the power that Standard exercised over both independent producers and refiners. It is still true today that independent producers must sell their crude to these pipelines before shipment and that independent refiners, with no other source of supply, must purchase crude from pipelines owned by the integrated majors.

TABLE 11.—JOINT VENTURES IN THE OIL PIPELINE INDUSTRY

Pipeline company and coowners	Percent held by each
Badger Pipeline Co. (assets=$12,400,000):	
Atlantic-Richfield	34
Cities Service	32
Texaco	22
Union Oil	12
Dixie Pipeline Co. (assets=$46,400,000):	
Amoco	12.1
Atlantic-Richfield	7.4
Cities Service	5.0
Continental	4.1
Exxon	11.1
Mobil	5.0
Phillips	14.5
Shell	5.5
Texaco	5.0
Gulf	18.2
Transco	3.6
Allied Chemical	8.6
Laurel Pipeline Co. (assets=$35,900,000):	
Gulf	49.1
Texaco	33.9
Sohio	17.0
Colonial Pipeline Co. (assets=$480,200,000):	
Amoco	14.3
Atlantic-Richfield	1.6
Cities Service	14.0
Continental	7.5
Phillips	7.1
Texaco	14.3
Gulf	16.8
Sohio	9.0
Mobil	11.5
Union Oil	4.0
Plantation Pipeline Co. (assets=$176,100,000):	
Exxon	48.8
Shell	24.0
Refiners Oil Corp	27.1
Four Corners Pipeline Co. (assets=$20,900,000):	
Shell	25
Chevron	25
Gulf	20
Continental	10
Atlantic-Richfield	10
Superior	10
Olympic Pipeline Co. (assets=$30,700,000):	
Shell	43.5
Mobil	29.5
Texaco	27.0
Wolverine Pipeline Co. (assets=$21,800,000):	
Union Oil	26
Mobil	21
Texaco	17
Clark	11
Marathon	10
Cities Service	8
Shell	7
Platte Pipeline Co. (assets=$33,000,000):	
Continental	20
Marathon	25
Union Oil	15
Atlantic-Richfield	25
Gulf	15
West Shore Pipeline Co. (assets=$17,600,000):	
Shell	20
Amoco	16.5
Mobil	14
Texaco	9
Marathon	9
Clark	8
Cities Service	8
Continental	6.5
Union Oil	5.5
Exxon	3.5
Wyco Pipeline Co. (assets=$14,100,000):	
Amoco	40
Texaco	40
Mobil	20
Yellowstone Pipleine Co. (assets=$16,000,000):	
Continental	40
Exxon	40
Husky	6
Union Oil	14
West Texas Gulf Pipeline Co. (assets=$19,800,000):	
Gulf	57.7
Cities Service	11.4
Sun	12.6
Union Oil	9.0
Sohio	9.2
Chicap Pipeline Co. (assets=$25,600,000):	
Union Oil	43.4
Clark	33.2
Amoco	23.4
Cook Inlet Pipeline Co.:	
Atlantic-Richfield	20
Marathon	30
Union Oil	30
Mobil	20
Texas-New Mexico Pipeline Co. (assets=$30,500,000):	
Texaco	45
Atlantic-Richfield	35
Cities Service	10
Getty	10

However, a notable difference between the past and the present is that today's pipelines are *jointly* owned by the integrated majors. Whereas early in this century Standard's control of the pipeline network gave it a distinct upper hand over all of its rivals, today's joint venture arrangements, which dominate the oil pipeline industry, draw ostensibly independent firms together into the common pursuit of a mutual purpose. Moreover, these jointly owned transportation links between producing, refining, and marketing operations (about three-fourths of all crude and one-fourth of refined products move through pipelines) require that producing and processing operations of the various partners be coordinated with each other so that the while vertically integrated system functions smoothly. Whatever redeeming features some may see as a result of this mutual interdependence, there can be no doubt that it is not conducive to vigorous economic competition.

Nor does the fact that these specific corporate interties involve only oil speak well for competition in natural gas markets. As is well known, the important consideration is that a joint venture provides a common meeting place where supposedly rival firms may legally cooperate, and, regardless of the purpose of the venture, the result will be a close association and collaboration between the parties involved. This cannot help but spill over into their other activities. Today when one counts the myriad of common meeting places which pervade the petroleum industry, one is hardly surprised that there is considerable "mutual cooperation" among the major petroleum companies and little hard fought competition.

Joint Production

Only four of the sixteen largest majors with interests in Federal offshore producing leases own 50 percent or more of their leases independently. Conversely, ten of the sixteen own 80 percent or more of their offshore properties jointly with each other. In addition, very few companies outside of the top sixteen have any independent holdings at all. In addition to the top 16, twenty-three medium to large size producers were surveyed. Of these, only two held as much as 25 percent of their leases independently and 17 had no independently owned leases at all. A tabulation of these direct corporate interties is presented in Table 12.

These direct relationships do not, of course, reveal the full degree of mutual interdependence that exists in offshore petroleum production. Table 12 shows, for example, that Mobil Oil, which has six independently owned leases, is a joint partner with Continental in 19 leases, with Cities Service and Getty in 8 each, with Gulf in 7, Chevron in 5, and with Exxon and Amoco in 4 each. In turn, Continental, Cities Service, and Getty have a substantial number of joint ventures with Atlantic Richfield and Tenneco; while Gulf has 4 with Phillips; and Amoco has 29 joint ventures with Texaco, 12 with Union Oil of California, 8 with Southern Natural and 4 each with Kerr McGee, Superior, and Pennzoil. Thus, the web of offshore production interties is even more encompassing than a superficial reading of Table 12 may suggest at first blush. Figure 2 is a more vivid illustration of these complex connections.

TABLE 12.—JOINT OWNERSHIP OF FEDERAL OFFSHORE PRODUCING LEASES

Company	Number of leases	Independently owned	Major partners	Number of joint ventures[1]
THE MAJORS				
Amerada-Hess	15	0	Marathon	13
			Signal	14
			Louisiana Land	14
Atlantic-Richfield	94	3	Cities	85
			Getty	83
			Continental	87
			Tenneco[2]	4
			Standard Oil of California (Chevron).	2
			El Paso[2]	2
Cities Service	101	1	Atlantic	85
			Getty	93
			Continental	91
			Mobil	2
			Tenneco[2]	7
			Standard Oil of California (Chevron).	2
Continental	119	1	Atlantic	87
			Cities	91
			Getty	87
			Mobil	19
			Tenneco[2]	8
			Standard Oil of California (Chevron).	2
			Superior	2
			Transocean	2
			Southern Natural[2]	2

TABLE 12.—JOINT OWNERSHIP OF FEDERAL OFFSHORE PRODUCING LEASES—Continued

Company	Number of leases	Independently owned	Major partners	Number of joint ventures [1]
Getty	100	2	Atlantic	83
			Cities	93
			Continental	87
			Mobil	8
			Tenneco [2]	4
			Standard Oil of California (Chevron).	3
			Phillips	3
			Superior	2
			Transocean	2
			So. Natural [3]	2
			Allied Chemical	3
Gulf	51	34	Mobil	7
			Standard Oil of New Jersey (Exxon).	6
			Phillips	4
			Kerr-McGee	2
Marathon	18	0	Amerada	13
			Signal	13
			Louisiana Land	13
			Union	5
			Sun	3
Mobil	52	6	Continental	19
			Cities	8
			Getty	8
			Gulf	7
			Standard Oil of California (Chevron).	5
			Standard Oil of New Jersey (Exxon).	4
			Standard Oil of Indiana (Amoco)	4
			Pennzoil [2]	2
Phillips	16	3	Keer-McGee	7
			Gulf	4
			Getty	3
			Standard Oil of Indiana (Amoco)	3
			Sun	3
			So. Natural [2]	2
			Allied Chemical	3
Shell	68	64	Standard Oil of California (Chevron).	2
Chevron	105	86	Mobil	5
			Getty	3
			Atlantic	2
			Cities	2
			Continental	2
Amoco	60	3	Texaco	29
			Union	12
			S. Natural [2]	8
			Mobil	4
			Kerr-McGee	4
			Superior	4
			Tenneco [2]	3
			Phillips	3
			Pennzoil [2]	4
			Texas Eastern [2]	2
Exxon	52	43	Gulf	6
			Mobil	4
Sun	19	0	Burmah	11
			Murphy	10
			Kerr-McGee	4
			Union	3
			Phillips	3
			Marathon	3
			Cabot	3
			Diamond Shamrock	3
			Anadarko [2]	3
Texaco	55	16	Standard Oil of Indiana (Amoco)	29
			Tenneco [2]	9
Union Oil	37	18	Standard Oil of Indiana (Amoco)	12
			Marathon	5
			Superior	4
			Sun	3
			Texas Eastern [2]	2
SELECTED MEDIUM SIZED FIRMS				
Tenneco Oil [2]	51	24	Texaco	
			Continental	8
			Cities	7
			Consolidated [2]	6
			Columbia Gas [2]	6
			Texas Gas Trans. [2]	6
			Forest	6

TABLE 12.—JOINT OWNERSHIP OF FEDERAL OFFSHORE PRODUCING LEASES—Continued

Company	Number of leases	Independently owned	Major partners	Number of joint ventures[1]
Kerr-McGee	29	0	Phillips	7
			Cabot	12
			So. Nat.[2]	8
Cabot Corp	12	0	Sun	3
			Kerr-McGee	12
Pennzoil[2]	9	1	Standard Oil of Indiana	4
Consolidated[2]	33	0	Columbia Gas[2]	26
			Texas Gas Trans.[2]	25
			Forest	26
			Tenneco[2]	6
Columbia Gas[2]	33	0	Consolidated[2]	26
			Texas Gas[2]	27
			Forest	33
			Tenneco[2]	6
Texas Gas[2]	28	0	Consolidated[2]	25
			Columbia Gas[2]	27
			Forest	28
			Tenneco[2]	6
Forest Oil	34	0	Consolidated[2]	26
			Columbia Gas[2]	33
			Texas Gas[2]	28
			Tenneco[2]	6
Murphy-Ocean	32	1	Sun	10
			Burmah	21
Burmah	23	0	Sun	11
			Murphy-Ocean	21
Signal	15	1	Amerada	14
			Marathon	13
			Louisiana Land	14
Louisiana Land and Exploration	14	0	Amerada	14
			Marathon	13
			Signal	14
Superior	21	10	Standard Oil of Indiana (Amoco)	4
			Union	4
			Transocean	7
Transocean	14	0	Superior	7
			Hunt	7
			Placid	7
			Ashland	7
Hunt	17	3	Transocean	7
			Placid	9
			Ashland	7
Ashland	7	0	Transocean	7
			Hunt	7
			Placid	7
So. Natural[2]	15	0	Standard Oil of Indiana (Amoco)	8
			Kerr-McGee	8
Allied Chemical	3	0	Getty	3
			Phillips	3
Anadarko[2]	3	0	Sun	3
			Diamond Shamrock	3
Diamond Shamrock	4	0	Sun	3
			Anadarko[2]	3
Texas Eastern[2]	2	0	Standard Oil of Indiana (Amoco)	2
			Union	2
El Paso[2]	2	0	Atlantic	2
Placid	15	0	Transocean	7
			Hunt	9
			Ashland	7

[1] May add to more than total number of leases when three or more firms participate in individual joint ventures.

[2] This company or an affiliate is a major interstate gas pipeline.

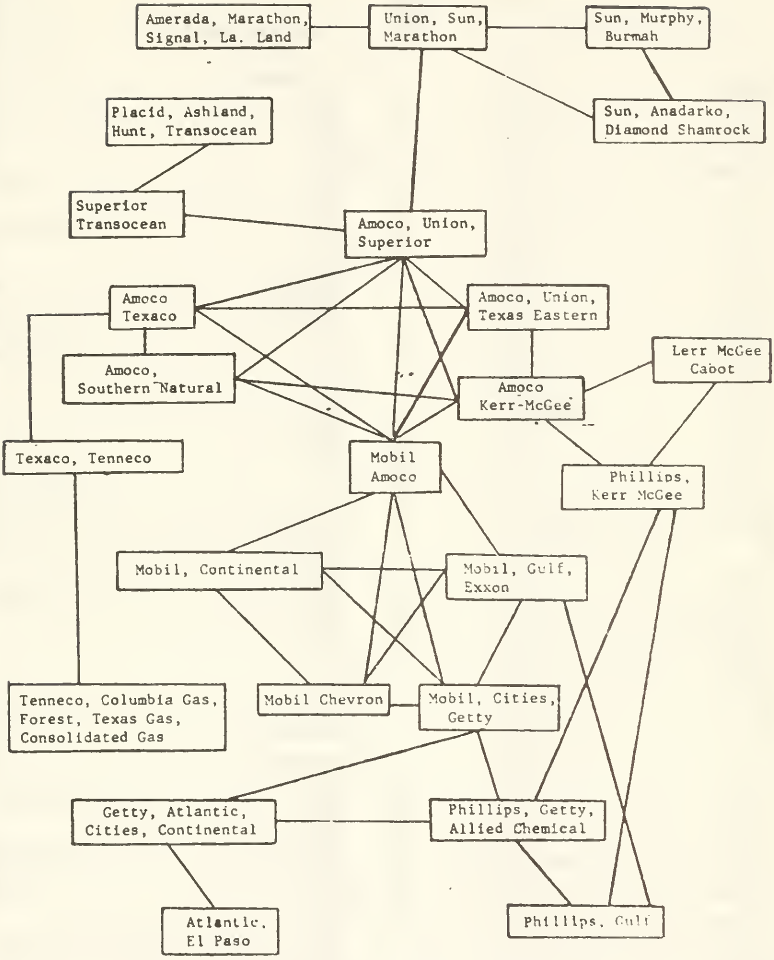
Source: U.S. Department of the Interior.

The ownership of onshore producing leases is also highly interconnected. Of the eighteen largest major producers in the State of Louisiana, fourteen have 5 or more direct interlocks with the other seventeen. Continental, for example, has 28 joint ventures with Atlantic, 27 with Cities Service, 27 with Getty, 16 with Mobil, 13 with Exxon, and 11 each with Amoco and Sun.

In addition, thirty-eight other medium and large producers in Louisiana were studied. All had substantial interlocking lease ownership arrangements with the largest majors. For example, in addition to Continental's major interties listed above, Continental also had the following number of lease interties with other producers in Louisiana:

Figure 2

Jointly Owned Leases (Federal Domain)


Amerada, Marathon, Signal, La. Land
Union, Sun, Marathon
Sun, Murphy, Burmah
Placid, Ashland, Hunt, Transocean
Sun, Anadarko, Diamond Shamrock
Superior Transocean
Amoco, Union, Superior
Amoco Texaco
Amoco, Union, Texas Eastern
Amoco, Southern Natural
Kerr McGee Cabot
Amoco Kerr-McGee
Texaco, Tenneco
Mobil Amoco
Phillips, Kerr McGee
Mobil, Continental
Mobil, Gulf, Exxon
Tenneco, Columbia Gas, Forest, Texas Gas, Consolidated Gas
Mobil Chevron
Mobil, Cities, Getty
Getty, Atlantic, Cities, Continental
Phillips, Getty, Allied Chemical
Atlantic, El Paso
Phillips, Gulf

Apache Oil	33	Ocean Drilling	28
C & K Petroleum	14	Offshore Co	17
Consolidated Gas	2	Pelto Oil	21
Diamond Shamrock	6	Pennzoil	22
Dixilyn Corporation	21	Sea Drilling	45
Exchange Oil and Gas	8	Southdown-Burmah	29
Fluor Corporation	49	Southern Natural	17
Inexco	6	Zapata Offshore	43
Monsanto	5	Tenneco Oil	3
Murphy Oil	4	Gulf Oil	3
Newmont Oil	133	Occidental Petroleum	21

A complete tabulation of these Louisiana Lease ownership interlocks is reported in Table 13.

In addition to these studies of the ownership of Federal offshore producing leases and State of Louisiana leases, a study has also been made of producing units in the Permian Basin in West Texas. Again, what emerges is a picture of extensive intercorporate interties. As shown in the following matrix, Table 14, literally every one of the sixteen large major oil companies studied had a significant number of joint producing arrangements with every other major.

TABLE 13.—JOINT OWNERSHIP OF STATE OF LOUISIANA PETROLEUM LEASES BY LARGE MAJOR PRODUCERS

Company and major partners	Number of jointly held state leases
Amerada-Hess:	
Phillips	36
Amoco	10
Sohio	2
Atlantic-Richfield:	
Cities	27
Continental	28
Getty	26
Union	10
Marathon	7
Texaco	4
Tenneco	4
Amoco	3
Chevron	2
Sohio	2
Cities Service:	
Atlantic	27
Continental	27
Getty	31
Exxon	2
Continental:	
Atlantic	28
Cities	27
Getty	27
Mobil	16
Exxon	13
Amoco	11
Sun	11
Tenneco	3
Gulf	3
Getty:	
Gulf	51
Atlantic	26
Cities	31
Continental	27
Exxon	27
Sohio	4
Tenneco	4
Amoco	4
Mobil	3
Sun	3
Shell	2
Texaco	2
Gulf:	
Exxon	62
Getty	51
Sohio	13
Shell	12
Amoco	7
Texaco	6
Chevron	6
Tenneco	5
Mobil	5
Continental	3
Sun	3
Phillips	2
Amerada	2
Marathon:	
Atlantic	7
Tenneco	3
Mobil:	
Continental	16
Amoco	8
Gulf	5
Sun	4
Texaco	4
Tenneco	3
Getty	3
Exxon	2
Phillips:	
Amerada	36
Sun	7
Amoco	3
Gulf	2
Shell:	
Gulf	12
Chevron	8
SHELL—Continued	
Exxon	5
Amoco	5
Texaco	5
Getty	2
Chevron:	
Shell	8
Gulf	6
Texaco	3
Exxon	3
Atlantic	3
Amoco:	
Texaco	11
Continental	11
Amerada	10
Mobil	8
Gulf	7
Shell	5
Sun	5
Tenneco	5
Exxon	4
Getty	4
Atlantic	3
Phillips	3
Union	3
Exxon:	
Gulf	62
Getty	27
Continental	13
Texaco	11
Tenneco	5
Shell	5
Amoco	4
Chevron	3
Mobil	2
Cities	2
Union	2
Sohio:	
Gulf	13
Getty	4
Atlantic	2
Amerada	2
Sun:	
Continental	11
Phillips	7
Amoco	5
Mobil	4
Getty	3
Gulf	3
Tenneco	3
Union	3
Tenneco:	
Exxon	5
Amoco	5
Gulf	5
Atlantic	4
Getty	4
Continental	3
Marathon	3
Mobil	3
Sun	3
Texaco:	
Exxon	11
Amoco	11
Gulf	6
Shell	5
Mobil	4
Atlantic	4
Chevron	3
Getty	2
Union	2
Union Oil:	
Atlantic	10
Amoco	3
Sun	3
Exxon	2
Texaco	2

TABLE 13 A.—JOINT OWNERSHIP OF STATE OF LOUISIANA LEASES[1] BY THE LARGEST INTEGRATED PETROLEUM COMPANIES AND OTHER SELECTED PRODUCERS

Producer	Number of State leases	Major partners	Number of joint ventures
Allied Chemical	15	Getty	4
		Sun	3
Anthony Oil	9	Atlantic	3
		Marathon	3
		Tenneco	3
Apache Oil	35	Continental	33
		Mobil	33
		Amoco	21
Austral Oil	6	Amerada	2
		Cities	2
		Gulf	2
C. & K. Petroleum	16	Continental	14
		Mobil	14
		Amoco	8
		Texaco	2
Clinton Oil	43	Sun	8
		Gulf	4
		Getty	2
		Exxon	2
Consolidated Gas	37	Gulf	7
		Chevron	6
		Union	6
		Marathon	5
		Continental	2
		Mobil	2
		Exxon	2
		Texaco	2
Delta Development	2	Gulf	2
		Exxon	2
Diamond Shamrock	10	Mobil	6
		Continental	6
Dixilyn Corp	21	Continental	21
		Mobil	21
		Amoco	21
Exchange Oil & Gas	49	Mobil	9
		Continental	8
		Gulf	7
		Atlantic	5
		Chevron	3
		Amerada	2
		Exxon	2
		Sohio	2
Forest Petroleum	5	Amerada	2
		Exxon	2
Fluor Corp	58	Continental	49
		Mobil	49
		Amoco	23
General American of Texas	37	Sun	9
		Gulf	3
		Atlantic	3
General Crude	19	Sun	9
Inexco	7	Continental	6
		Exxon	4
Kerr-McGee	23	Phillips	10
		Amoco	3
		Union	3
Louisiana Land & Exploration Co	47	Phillips	35
		Texaco	30
		Amoco	18
		Getty	8
		Gulf	4
		Tenneco	4
		Exxon	2
		Union	2
Monsanto Chemical	8	Sun	6
		Continental	5
		Gulf	3
		Marathon	3
		Amoco	3
		Tenneco	3
		Texaco	3
Munoco	6	Sun	6
Murphy Oil	17	Sun	6
		Mobil	4
		Continental	4
		Sohio	2

TABLE 13A.—JOINT OWNERSHIP OF STATE OF LOUISIANA LEASES [1] BY THE LARGEST INTEGRATED PETROLEUM COMPANIES AND OTHER SELECTED PRODUCERS—Continued

Producer	Number of State leases	Major partners	Number of joint ventures
Natural Gas & Oil	21	Tenneco	3
		Chevron	2
Newmont Oil	139	Continental	133
		Mobil	118
		Amoco	23
		Texaco	5
		Chevron	4
		Exxon	3
North Central	16	Mobil	3
		Atlantic	2
		Chevron	2
		Sohio	2
Occidental Petroleum	37	Continental	21
		Amoco	21
		Mobil	20
		Union	6
		Sun	2
		Phillips	2
Ocean Drilling	55	Mobil	28
		Continental	28
		Chevron	5
		Gulf	4
		Texaco	2
Offshore Co	17	Amoco	17
		Continental	17
		Mobil	16
Pelto Oil	28	Continental	21
		Mobil	14
		Atlantic	4
		Chevron	3
Pennzoil	44	Continental	22
		Mobil	22
		Amoco	22
		Sohio	7
		Gulf	5
		Exxon	4
		Atlantic	3
		Getty	3
		Marathon	2
Placid Oil	49	Gulf	6
		Exxon	6
		Texaco	5
		Shell	5
		Getty	4
		Mobil	4
		Amoco	4
		Tenneco	4
		Sun	3
		Cities	2
Samedan Oil	4	Atlantic	2
		Sun	2
Sea Drilling	45	Continental	45
		Mobil	45
		Amoco	21
Signal Oil	14	Exxon	4
		Shell	3
		Texaco	2
		Gulf	2
South down-Burmah	46	Continental	29
		Mobil	14
		Atlantic	4
Southern Natural	32	Amoco	20
		Mobil	17
		Continental	17
		Sun	5
		Atlantic	2
		Phillips	2
		Chevron	2
Southwest Gas Prod	8	Sohio	8
		Gulf	6
		Amerada	2
Transocean Oil	15	Gulf	4
		Phillips	2
Zapata Offshore	53	Continental	43
		Mobil	43
		Amoco	15

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[1] Includes disputed leases in the Federal Domain.

[2] Totals may add to more than the total number of leases when more than two producers have interests in jointly held leases.

TABLE 14.—JOINT PRODUCTION IN THE PERMIAN BASIN (TEXAS)—MATRIX SHOWS NUMBER OF JOINT UNITIZATION AGREEMENTS

	Amerada 1	Atlantic 2	Cities 3	Continental 4	Getty 5	Gulf 6	Marathon 7	Mobil 8	Phillips 9	Shell 10	Amoco 11	Exxon 12	Sohio 13	Sun 14	Texaco 15	Union 16
1. Amerada																
2. Atlantic	16															
3. Cities	14	32														
4. Continental	8	18	15													
5. Getty (Skelly)	17	32	19	9												
6. Gulf	5	3	12	8	17											
7. Marathon	7	10	6	4	8	6										
8. Mobil	9	25	14	10	20	12	8									
9. Phillips	13	33	20	15	20	12	6	13								
10. Shell	9	28	15	11	17	11	8	10	16							
11. Standard of Indiana (Amoco)	18	36	30	20	29	21	9	24	29	25						
12. Standard of New Jersey (Exxon)	12	29	14	13	18	20	6	18	17	15	29					
13. Standard of Ohio (Sohio)	4	10	4	6	6	5	2	6	6	2	8	8				
14. Sun	12	29	20	13	23	15	5	14	21	15	33	17	6			
15. Texaco	12	42	23	19	25	23	8	19	22	18	30	22	10	23		
16. Union	5	18	12	5	13	13	4	13	11	5	21	12	7	17	11	

It may, of course, be argued that these Permian Basin interties, through unitization agreements, are ancillary to legitimate and desirable conservation purposes.[10] It is known, for example, that the unitized operation of an oil or gas field can serve to discourage inefficient production practices and may permit greater ultimate resource recovery. This is why, for example, the State of Louisiana requires mandatory unitization of producing areas under certain circumstances. That laudable purpose notwithstanding, it should be noted that the arrangement also provides a framework within which petroleum producers make joint production decisions. To argue that we should not be concerned about the anticompetitive consequences of certain interlocks because, in addition to undermining competition, they may serve a legitimate purpose, is rather like arguing that because an electric utility monopoly may be the most efficient means of serving a specified market we should conclude that the incident lack of competition does not require regulation. Both arguments are obviously illogical.

International Joint Ventures

In addition to the interrelated domestic operations of the major American petroleum companies, we should not lose sight of the fact that it is largely these same corporate entities or their affiliates which make up the international oil cartel. As was pointed out before this Subcommittee in 1969,

> The directors of the Standard of New Jersey [now Exxon] and Socony-Vacuum [Mobil], who determine the policies of the Arabian American Oil Co.. [the largest international combine in Saudi Arabia] are the same men who shape the behavior of the Iraq Petroleum Company. The directors of Anglo-Iranian Company [now British Petroleum, Ltd. which controls Standard Oil of Ohio]. who assist in making high oil policy for Iraq and Iran, participate along with the directors of Gulf, in planning the price and production policies in Kuwait.[11]

This earlier testimony does not go far enough in describing the extent of the international interties that exist between multinational oil companies like British Petroleum, Shell, Exxon, Mobil, Gulf, Texaco, Chevron and others. Table 15 lists some of these, though it too is far from complete. As in so many other cases in the petroleum industry, full and accurate data are not publicly available.

While a limited quantification of 18 international joint ventures is reported in table 15, a review of petroleum industry trade publications over the past decade indicates that there is a far more extensive system of international interties among the major American oil companies. A simple tabulation of reports on international interties as noted in *The Oil and Gas Journal* is presented in the following matrix table 16).

This evidence indicates that, unlike the situation in certain ineffectively competitive domestic industries, we cannot rely upon the elimination of international trade barriers to greatly improve competition in American petroleum markets. While the abandonment of import barriers, such as the recently abandoned oil import quotas, will provide some supply relief, we should recognize that foreign supplies will flow to American markets through the same corporate conduits which are already thoroughly interdependent both domestically and abroad.

TABLE 15.—*Selected major international joint ventures of large integrated petroleum companies*

[In percent]

1. Abu Dhabi Petroleum Co., Ltd.:

B.P.	23.75	Exxon	11.875
Shell	23.75	Mobil	11.875

1970 crude production—155 million barrels.

2. Arabian American Oil Co.:

Texaco	30	Chevron	30
Exxon	30	Mobil	10

1971 crude production—1,449.05 million barrels.

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[10] Producing units in Texas do not necessarily conform to the geographic and geological boundaries of a producing field. Moreover. when they do, they do not necessarily include all producers in that field. This. of course, undermines the conservation defense.

[11] Abstract of the Report on the International Petroleum Cartel by the Federal Trade Commission in Hearings before the Subcommittee on Antitrust and Monopoly of the Senate Judiciary Committee, "Governmental Intervention in the Market Mechanism—The Petroleum Industry," 91st Congress, 1st Session, pt. 1, at 553 (1969).

TABLE 15.—*Selected major international ventures of large integrated petroleum companies*—Continued

3. Australasian Petroleum Co., Pty. Ltd.:

B.P.	38	Oil Search	50
Mobil	12		

Capital equals A$48.6 million pref, plus A$46.4 ordinary.

4. Basrah Petroleum Co., Ltd.:

B.P.	23.75	Exxon	11.875
Shell	23.75	Mobil	11.875

1971 Crude production (first 6 months)—100 million barrels.

5. Bataan Refining Corp.:

Exxon	57	Mobil	43

Capacity equals 39.4 million barrels per year.

6. Caltex:

Texaco	50	Chevron	50

1971 Gross Operating Income equals $2.3 billion.

7. Gewerkschaft Brigitta and Gewerkschaft Elwerath:

Shell	50	Exxon	50

1970 gas production equals 250 million Mcf.
1970 crude production equals 15 million barrels.

8. Iranian Oil Participants, Inc.:

Mobil	7	B.P.	40
Exxon	7	Shell	14
Chevron	7	Atlantic	1.67
Texaco	7	Signal	.83
Gulf	7	Getty	.83

1971 crude production equals 1.3 billion barrels.

9. Iraq Petroleum Co.:

B.P.	23.75	Exxon	11.875
Shell	23.75	Mobil	11.875

10. Irish Refining Co., Ltr.:

Shell	40	Texaco	20
Exxon	40		

1970 throughput equals 17.8 million barrels.

11. Kuwait Oil Co., Ltd.:

Gulf	50	B.P.	50

1971 crude production equals 1.27 billion barrels.

12. Lavan Petroleum Co.:

Atlantic	12.5	Sun	12.5
Murphy	12.5	Union	12.5

1970 crude production equals 51.8 million barrels.

13. Oasis Oil Co. of Libya, Inc.:

Marathon		Shell	
Amerada			

1970 crude production equals 345 million barrels.

14. Oberriheinische Mineraloelwerke Gmb H:

Texaco	45	Continental	10

Refinery throughput equals 51 million barrels/year.

15. N. V. Nederlandse Aardolie Maatschappij:

Shell	50	Exxon	50

1970 gas production equals 1.18 billion Mcf.
1970 crude production equals 13.1 million barrels.

16. Pakistan Refinery, Ltd.:

Exxon		Chevron	
Shell		Texaco	

1970 throughput equals 21 million barrels.

17. Petroleum Refineries Pty. Ltd.:

Mobil	65	Exxon	35

Capacity equals 51 million barrels per year.

18. Raffinaderej Shell Mersin, N. V.:

Shell	27	Mobil	
B.P.			

Capacity equals 34 million barrels per year.

TABLE 16.—REPORTED FOREIGN JOINT VENTURES IN EXPLORATION AND DEVELOPMENT (1960-70)[1]

	Amerada 1	Atlantic 2	Cities 3	Continental 4	Getty 5	Gulf 6	Marathon 7	Mobil 8	Phillips 9	Chevron 10	Amoco 11	Exxon 12	Sohio 13	Shell 14	Sun 15	Texaco 16	Union 17
1. Amerada																	
2. Atlantic	1																
3. Cities	2	31															
4. Continental	15	9	11														
5. Getty		6	2	2													
6. Gulf		1		1													
7. Marathon	21	18	13	29	1												
8. Mobil	2	10		1		9											
9. Phillips		15		3		2	3	2									
10. Standard of California (Chevron)		1				9		14	3								
11. Standard of Indiana (Amoco)	7	10	5			7		10	2								
12. Standard of New Jersey (Exxon)		5	1	1	5	7	1	33	5	8	13						
13. Standard of Ohio (Sohio)		2	3	4		12		15	1	4		10					
14. Shell	4	3		6		15	4	23	2	17	2	63	66				
15. Sun	8	36	4	4	12	2	4	5	24		9	4	1	1			
16. Texaco	2	9 0	5	3		28	2	15	2	59	4	10	6	22	6		
17. Union	5	17	2	6	2	1	2	2	1		9	2		2	19	1	

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[1] As reported in "The Oil and Gas Journal."

Other Interties

The evidence presented above was obtained entirely from public sources. In addition, American Petroleum Institute records indicate that there are substantial crude oil exchange agreements among the majors, ranging from more than 50 percent of their total domestic liquid hydrocarbon production for some companies down to only a few percentage points for others. During 1971 and 1972, for example, Ashland Oil was heavily dependent upon Getty for crude and Standard of Ohio was significantly dependent upon Shell. Other significant crude exchanges took place between the following:

Amerada-Hess and Shell
Cities Service and Chevron
Continental and Gulf
Marathon and Atlantic
Mobil and Phillips
Tenneco and Getty
Union Oil and Exxon

In addition, it is known that there are substantial product (e.g., gasoline) exchange agreements among the majors which draw them still closer together within their complex ring of mutual interties. Details on these product exchanges are not presently available, but it is hoped that the current FTC investigation of the domestic petroleum industry will provide us with these and other pertinent data.

In summary, factual information presented here is based solely on public records and, therefore, probably substantially underestimates the full extent of mutual interdependence among firms in the petroleum industry. This information, nevertheless, discloses a pervasive pattern of interrelated interests, and it demonstrates that the industry is not sufficiently competitive to serve the public interest.

Vertical Integration

It is a well established fact that vertical integration on the oil side of the petroleum industry has served to inhibit workable competition in crude oil production and gasoline retailing. In general, even the most outspoken critics of natural gas regulation acknowledge the anti-competitive shortcomings induced by vertical integration in oil. For example, one such critic who, unencumbered by the pertinent facts, concluded that natural gas production "must be highly competitive," acknowledged with respect to oil:

> Vertical Integration: The major companies dominate the market and are likely to continue to do so . . . .
>
> Since there do not appear to be great economies in vertical integration, it seems likely that the industry would be more competitive and perform better without the existing vertical integration . . .
>
> Not only is vertical integration troublesome, but the increasing number of joint ventures involved in exploration, development, and in transportation creates a community spirit not conducive to vigorous competition.[12]

Other analysts have been even less equivocal. For example, the authors of a recent book on gasoline marketing concluded that:

> Vertical integration in the petroleum industry has thus become a malignant force for harnessing monopoly power and for transmitting it to markets which would otherwise be workably competitive. So long as the present structural arrangement persists, workable competition in refining and marketing will always be frustrated. . . . The petroleum industry is becoming more concentrated in the hands of those vertically integrated oil companies having strong crude-oil positions. If the petroleum industry is permitted to continue to administer artificially high crude oil prices, competition in the industry will become still more limited.[13]

The vertical integration issue that I wish to discuss here, specifically vertical integration on the natural gas side of the petroleum industry, has not received equal or adequate attention by industry analysts. As shown in Table 17, virtually all of the largest interstate natural gas pipeline companies are also involved in petroleum exploration and development—either directly or through corporate affiliates. In some instances (e. g., El Paso which serves the West Coast and Florida Gas which serves the Southeast) the producer affiliate is a pipeline subsidiary, while in other cases (e.g., Colorado Interstate which serves the Mountain States and Cities Service which serves the West Central States) the pipeline is a producer subsidiary. In still other cases (e.g., Tennessee which serves the Northeast and United which serves the South) the producer and the pipeline are both affiliates of the same corporation. In any event, there can be little doubt that with pipelines and their affiliates heavily involved in petroleum production, the contention that arms-length bargaining between producers and pipelines will be sufficient to protect the public's interest in just and reasonable natural gas prices is ludicrous. Clearly, this is still another major factual reason for denying that there is any semblance of workable competition in the natural gas industry as it is presently structured.

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[12] Thomas G. Moore, "The Petroleum Industry," in Walter Adams, *The Structure of American Industry*. (New York: Macmillan), 1971.

[13] Fred C. Allvine and James M. Patterson, *Competition Ltd.: The Marketing of Gasoline*, Indiana University Press, 1972.

TABLE 17.—*Major interstate gas pipelines and their producing affiliates*

Interstate Pipeline Co.	*Exploration, development, and producing affiliates*
Arkansas Louisiana Gas Co	Arkla Exploration Co.
Cities Service Gas Co	Cities Service Oil Co., Cities Service Gas Resources Co., Hydrocarbon Production Co., Inc.
Colorado Interstate Gas Co	Coastal States Gas Producing Co., LO-VACA Gathering Co., Colorado Oil and Gas Corp., Nueces Industrial Gas Co.
Columbia Gas Transmission Corp	Columbia Gas Development Corp.
Consolidated Gas Supply Corp	CNG Producing Co.
El Paso Natural Gas Co	Odessa Natural Gasoline Co., Odessa Natural Corp., Trebol Drilling Co., Pecos Co.
Florida Gas Transmission Co	Florida Gas Exploration Co.
Lone Star Gas Co	Lone Star Producing Co.
Michigan Wisconsin Gas Co	American Natural Gas Production Co.
Natural Gas Pipeline Co. of America	Harper Oil Co.
Northern Natural Gas Co	(Produces under its own name)
Panhandle Eastern Pipeline Co	Anadarko Production Co., Pan Eastern Exploration Co., Panhandle Western Gas Co.
Southern Natural Gas Co	SONAT Exploration Co., The Offshore Co.
Tennessee Gas Transmission Co	Tenneco Oil Co.
Tennessee Gas Pipeline Co	Tenneco Exploration, Ltd., Tenneco Offshore Co., Inc., Tenneco West, Inc.
Texas Eastern Transmission Corp	La Gloria Oil and Gas Co., Texas Eastern Gas Supply Co.. Texas Eastern Maroc, Inc., Texas Eastern Exploration Co., Texas Eastern Oil Co.
Texas Gas Transmission Corp	Texas Gas Exploration Corp.
Transcontinental Gas Pipeline Corp	Transcontinental Production Co., Trans-Gulf Transmission Corp.
Transwestern Pipeline Co.[1]	Transwestern, Inc. Transwestern Gas Supply Co.
Trunkline Gas Co.[2]	
United Gas Pipeline Co	Pennzoil Producing Co., Pennzoil Petroleums, Ltd., Pennzoil Louisana and Texas Offshore, Inc., Pennzoil Offshore Gas Operator, Inc.

[1] Subsidiary of Texas Eastern Transmission Corp.

[2] Subsidiary of Transcontinental Gas Pipeline Co.

This direct evidence on vertical integration presents only a partial picture of the economic interties involved. Actually, the economic impact of vertical integration goes well beyond the dealings between a pipeline and its production affiliates. As was shown above in Table 8, fifteen of the twenty-one major offshore bidding combines included a major interstate pipeline producing affiliate. In addition, as shown in Table 12, ten of the sixteen largest majors with producing acreage in the Federal domain engaged in joint production with interstate pipeline affiliates. Finally, there are a multiplicity of financial interlocks through which interstate pipelines have, in effect, provided hundreds of millions of dollars in interest free loans to natural gas producers in order to speed new exploration and development.

All of these arrangements bring horizontally and vertically juxtaposed firms into close working relationships with each other. They *must* work together to further their joint interests. Consequently, each becomes familiar with the others and with each other's operations. Men in such close working relationships learn to consider one another's interests. This process of learning to live together is, of course, quite laudable in certain social and political contexts. The success of our Nation's international relations, for example, depends greatly upon this process. But it is, most assuredly, not the kind of institutional setting within which a free market economy can be expected to function efficiently. Real economic competition is made of tougher stuff. The petroleum industry's rhetoric about letting "free market forces" solve the energy crisis simply makes no sense within the present market context. In order to function both efficiently and in the public interest, "free markets" *must be competitive.* This means that the participants must be structurally and behaviorally independent of each other. That precondition, quite apparently, does not apply to the petroleum industry. Consequently, given present institutional arrangements, the industry's free market prescription would not produce a competitive end result. That brand of "free enterprise" means merely the removal of public constraints upon the operations of their thoroughly interrelated operations, and the end result would certainly fail to conform to what is in the public interest.

V. POLICY PROPOSALS

As shown above, market control in the petroleum industry, including the natural gas producing sector, is held by a closely knit consortium comprised of the large, fully integrated oil companies and their jointly interlocked affiliates. These firms, working in cooperation with each other, have the ability to control petroleum supplies and, in so doing, to maneuver for monopolistic market price levels.

Federal regulation of the field price of natural gas was supposedly designed to deal with this problem. Apparently, it is not working well. As in the case of fuel oil and gasoline, natural gas supplies are short and prices are rising rapidly. No one can deny that policy changes are needed. The prescription offered by the petroleum industry and its various spokesmen is for unrestrained "market freedom"—a situation wherein the industry (not the public) would be "free"; free, that is, to extract the maximum possible price that the market will bear.[14] Unless capitulation to the monopoly power of private economic interests is now viewed as a national policy alternative, this prescription makes no sense. Certainly, from the consuming public's view, it cannot be described as a rational stratagem.[15]

Alternatives to capitulation

1. The first and foremost step which must be taken in order to make the regulatory system workable is to eliminate the intrastate exemption which producers are now able to use as a leverage device in the interstate market. The typical procedure these days is for gas producers to whipsaw interstate prices to higher levels on the basis of the highest prices that have been paid in unregulated intrastate markets.

That this practice undermines the establishment of just and reasonable cost-based rates for natural gas is obvious. Why should producers voluntarily sell gas at competitive, cost-based price levels if there is an alternative unregulated market (1) where they can charge what the traffic will bear and (2) which they can use as a lever to force up interstate prices?

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[14] It should be noted that the industry is fond of urging petroleum prices which reflect "commodity value" rather than cost. Commodity value, however, is really nothing other than the monopoly price; even a total monolithic monopolist would be unable to charge more than his product is worth. The essence of monopoly is the ability to extract a price equal to full commodity value, regardless of how exorbitant the profit.

[15] Both *arrogant* sellers and *desperate* buyers could respond to this by saying: "What could possibly be worse for the consumer than having no gas? We might as well 'pay up' then and avoid the worst." Obviously, that position may make some sense from the point of view of an individual consumer who has no recourse but to capitulate to monopoly power, but Congress, presumably, is not so constrained.

What has not been as obvious, perhaps even unknown to some, is the fact that interstate sellers are also intrastate buyers! They are, therefore, in a unique position to manipulate the so-called "market price":

> e.g., Producer X buys gas in the intrastate market from another producer, Y, at a high price (perhaps X uses this gas as fuel in his oil refinery). Then X and Y both turn to the intrastate market (and to the FPC) and say, "Look at the high price level that has been established in the intrastate market; it's only reasonable that interstate prices keep pace."

In the fall of 1972, the FPC collected data on large intrastate gas commitments over the most recent 12 months from each of the seventy-five largest interstate gas suppliers. Information concerning the producers surveyed as well as aggregate quantities and prices was published by the Commission in November, 1972. However, the identify of the intrastate *buyers* was not revealed at that time. Table 18, below, presents such a listing. It is most instructive.

For example, there were 14 large intrastate buyers identified in the Permian Basin. They are as follows:

1. Pecos Growers Oil Company—This buyer is a subsidiary of Texas Oil and Gas Corp., which is also the parent of Pecos Growers Gas Co., Delhi Gas Pipeline Corp., Nueces Co., and the Tonkawa Gas Processing Co. Four of these corporations are major interstate sellers. In 1971 Pecos Oil sold 5.6 billion cubic feet to interstate pipelines, Pecos Gas sold 18.6 billion cubic feet, Delhi sold 8.5 billion cubic feet, and their mutual parent, Texas Oil and Gas, sold 14.2 billion cubic feet of gas in interstate commerce.
2. Pecos Growers Gas Company—See Pecos Growers Oil Company.
3. Intratax Gas Company—This company is a subsidiary of Houston Natural Gas which is also the parent of Houston Pipeline Co. and HNG Oil Corp. Houston Natural Gas also is a co-owner of Oasis Pipeline Co. along with its partners, Dow Chemical and Tengasco, a subsidiary of Tenneco, Inc. Houston Natural sold 9.1 billion cubic feet of gas to interstate pipelines in 1971, and through its subsidiaries controls substantial production acreage.
4. Llano, Inc.—No information available.
5. Lo Vaca Gathering Company—Lo Vaca is a subsidiary of Coastal States Producing Co., one of the largest intrastate producers. In 1971 Coastal States sold 34.1 billion cubic feet of gas to interstate pipelines and Lo Vaca sold 64.7 billion cubic feet in interstate commerce. Another Coastal States subsidiary, the Nueces Industrial Gas Co., had 1971 interstate sales of 45.2 billion cubic feet.
6. Texas Utilities Fuel Co.—This company is a subsidiary of Texas Utilities Co., which is also the parent of Bi-Stone Fuel Co. It also owns, with Lo Vaca (a Coastal States subsidiary), an intrastate pipeline system reaching from the Permian Basin to Dallas.
7. Delhi Gas Pipeline Corp.—See Pecos Growers Oil Co.
8. BTA Oil Producers—This company is an independent gas producer. In 1971, BTA sold 2.1 billion cubic feet of gas in interstate commerce.
9. Lone Star Gas Company—Lone Star's subsidiary, Lone Star Producing Co., sold 70.8 billion cubic feet of gas in interstate commerce in 1971.
10. Pioneer Natural Gas Co.—Pioneer is the parent of Pioneer Production Co. which sells gas in interstate commerce to Michigan Wisconsin Pipe Line Co., Natural Gas Pipeline Co. of America, Northern Natural, Panhandle Eastern, and Transwestern.
11. Amoco Gas Co.—Amoco is a subsidiary of Standard Oil of Indiana. Together with Midwest, another Indiana Standard subsidiary, Amoco ranks second behind Exxon in natural gas sales to interstate pipelines.
12. The Dow Chemical Co.—Dow is an independent natural gas producer.
13. Houston Pipeline Co.—See Intratex Gas Co.
14. Pennzoil Pipeline Co.—Pennzoil Pipeline is a subsidiary of United Gas Pipeline, which is a subsidiary of Pennzoil United, Inc. Pennzoil United, Inc. is also the parent of Pennzoil Producing Co., Pennzoil Petroleum, Ltd., Pennzoil Offshore Gas Operators, Inc., and Pennzoil Louisiana and Texas Offshore, Inc. Pennzoil United and its affiliates were the largest buyer of Offshore Louisiana leases in the December 1972 Federal offshore lease sale, and in June 1973 they had high bids totalling over $800 million in the Texas Offshore lease sale (out of a $1.6 billion total of high bids). Pennzoil is therefore one of the largest potential offshore gas producers. Their 1971 interstate sales totaled nearly 250 billion cubic feet.

These then are the *buyers* who are bidding up the intrastate price in the Permian Basin. Surely one can be forgiven for suspecting that when Pennzoil, Amoco, Coastal States, *et al.*, acting as intrastate buyers, bid up the price of gas, there may be some potential for certain fairly obvious ulterior motives. A complete list of all the major intrastate buyers in major producing areas who were identified by the FPC in the 1972 intrastate price survey is presented in Table 18. It would be quite incredible, in view of this information, to permit these parties to go on establishing so-called intrastate "market prices" which they and their own corporate affiliates subsequently press upon the interstate market. Surely this gaping regulatory loophole must be closed if regulation is to work. The exemption presently undermines the Federal government's ability to regulate interstate commerce.

TABLE 18.—INTRASTATE BUYERS IDENTIFIED IN THE 1972 FPC SURVEY OF INTRASTATE NATURAL GAS PRICES

(Docket R389A)

Area and intrastate buyer	Also a gas producer?[1]	Interstate pipelines served in 1971[1]
PERMIAN BASIN		
1. Pecos Growers Oil Co	Yes	Lone Star Gas Co., Natural Gas Pipeline Co., El Paso Natural Gas Co., Arkansas Louisiana Gas Co., Cities Service Gas Co., Colorado Interstate, Florida Gas Trans. Co., Michigan Wisconsin Pipeline Co., Northern Natural Gas Co., South Texas Natural Gas Gathering Co., Tennessee Gas Pipeline, Texas Eastern Trans. Corp., Trunkline Gas Co., Transcontinental Gas P.L., United Gas Pipeline Co.
2. Pecos Growers Gas Co	Yes	See Pecos Growers Oil Co above.
3. Delhi Gas Pipeline Corp	Yes	Do.
4. Intratex Gas Co	Yes	Consolidated Gas Supply Corp., Natural Gas P.L. Co., South Texas Nat. Gas Gath., Texas Eastern Trans. Corp., Texas Gas Pipe Line, Transcontinental Gas Pipeline Corp., Valley Gas Trans. Inc.
5. Houston Pipeline Co	Yes	See Intratex Gas Co. above.
6. Dow Chemical Co	Yes	None in 1971.
7. Lo-Vaca Gathering Co	Yes	Cities Service Gas, Columbia Gas Trans., Consolidated Gas Sup., Lone Star Gas Co., Natural Gas P. L., Co., South Texas Natural Gas Gathering Co., Tennessee Gas Pipeline, Texas Eastern Trans., Transcontinental Gas Pipeline Corp., Trunkline Gas Co., Arkansas Louisiana Gas, El Paso Natural Gas Co., Northern Natural Gas Co., Colorado Interstate Gas, Florida Gas Trans. Co.
8. Texas Utilities Fuel Co	Yes	None in 1971.
9. BTA Oil Producers	Yes	El Paso Natural Gas Co.
10. Lone Star Gas Co	Yes	Arkansas Louisiana Gas, Lone Star Gas Co., Natural Gas P.L. Co., Panhandle Eastern P. L., Texas Eastern Trans., Transcontinental Gas Pipeline Corp., United Gas P. L. Co.
11. Pioneer Natural Gas Co	Yes	Michigan Wisconsin P.L., Natural Gas P. L. Co., Northern Natural Gas Co., Panhandle Eastern P. L.
12. Pennzoil Pipeline Co	Yes	United Gas Pipeline Co., Arkansas Louisiana Gas Michigan Wisconsin P. L., Natural Gas P. L. Co., Sea Robin P. L. Co., South Texas Natural Gas Gathering Co., Southern Natural Gas Co., Tennessee Gas Pipeline, Texas Eastern Trans., Texas Gas Trans. Corp., Transcontinental Gas Pipeline Corp., Trunkline Gas Co., United Gas Pipeline Co., Columbia Gas Trans., Consolidated Gas Sup., Transwestern P. L. Co.
13. Amoco Gas Co	Yes	Arkansas Louisiana Gas Co., Cimarron Trans. Co., Cities Service Gas Co., Colorado Interstate Gas, Columbia Gas Trans., El Paso Natural Gas Co., Florida Gas Trans. Co., Lone Star Gas Co., Michigan Wis. P. L. Co., Miss. River Trans. Corp., Montana Dakota Utility Co., Mountain Fuel Sup. Co., Natural Gas P. L. Co., Northern Natural Gas Co., Northern Utilities Co., Panhandle Eastern P. L., Sea Robin P. L. Co., Southern Nat. Gas Co. Tennessee Gas Pipeline, Texas Eastern Trans. Corp., Texas Gas P. L. Corp., Texas Gas Trans. Corp., Transcontinental Gas P. L., Transwestern P. L. Co., Trunkline Gas Co., United Gas P. L. Co., Valley Gas Trans., Inc.
14. Llano, Inc	No	N/A.
TEXAS GULF COAST		
1. Amoca Gas Co	Yes	See Amoco Gas—Permian Basin.
2. Atlantic Richfield Co	Yes	Arkansas Louisiana Gas Co., Cimarron Trans. Co., Cities Service Gas Co., Colorado Interstate Gas Co., Columbia Gas Trans. Corp., El Paso Natural Gas Co., Florida Gas Trans. Co., Kansas Nebraska Natural Gas Co., Lone Star Gas Co., Michigan Wisconsin Pipeline, Montana Dakota Utility Co., Mountain Fuel Supply Co., Natural Gas P. L. Co., Northern Natural Gas Co., Northern Utilities Co., Panhandle Eastern P. L. Co., South Texas Natural Gas Gathering Co., Southern Natural Gas Co., Tennessee Gas Pipeline, Texas Eastern Trans. Corp., Texas Gas Trans. Corp., Transcontinental Gas P. L. Co., Transwestern P. L. Co., Trunkline Gas Co., United Gas P. L. Co., West Texas Gath. Co.

TABLE 18.—INTRASTATE BUYERS IDENTIFIED IN THE 1972 FPC SURVEY OF INTRASTATE NATURAL GAS PRICES (Docket R389A)—Continued

Area and intrastate buyer	Also a gas producer? [1]	Interstate pipelines served in 1971 [1]
3. Channel Industries Gas Co	Yes	Arkansas Louisiana Gas Co., Cimarron Trans. Co., Cities Service Gas Co., Columbia Gas Trans. Corp., El Paso Natural Gas Co., Florida Gas Trans. Co., Michigan Wisconsin P. L. Co., Mississippi River Trans. Corp., Montana Dakota Utility Co., Mountain Fuel Supply Co., Natural Gas P. L. Co., Northern Natural Gas Co., Oklahoma Natural Gas Gathering Corp., Panhandle Eastern P. L. Co., South Texas Natural Gas Gathering Co., Southern Natural Gas Co., Tennessee Gas Pipeline, Texas Eastern Trans. Corp., Texas Gas Trans. Corp., Transcontinental Gas P. L., Trunkline Gas Co., United Gas Pipeline Co., Western Trans. Corp., Kansas Nebraska Nat. Gas Co.
4. Coastal States Producing Co	Yes	See Lo-Vaca Gathering Co.—Permian Basin.
5. Texas Gas Utilities Co	Yes	Do.
6. Texas Southeastern Gas Co	Yes	Do.
7. Lo-Vaca Gathering Co	Yes	Do.
8. Continental Oil Co	Yes	Arkansas Louisiana Gas Co., Cascade Natural Gas Corp., Cities Service Gas Co., Colorado Interstate Gas Co., El Paso Natural Gas Co., Florida Gas Trans. Co., Kansas Nebraska Natural Gas Co., Lone Star Gas Co., Michigan Wisconsin P. L. Co., Montana Dakota Utility Co., Mountain Fuel Supply Co., Natural Gas P. L. Co., Northern Natural Gas Co., Northern Utilities Co., Panhandle Eastern P. L. Co., South Texas Natural Gas Gathering Co., Southern Natural Gas Co., Tennessee Gas Pipeline, Texas Eastern Trans. Corp., Texas Gas Trans. Corp., Transcontinental Gas P. L., Transwestern P. L. Co., Trunkline Gas Co., United Gas P. L. Co., West Texas Gathering Co.
9. Delhi Gas Pipeline Corp	Yes	See Delhi Gas Pipeline Corp.—Permian Basin.
10. Dow Chemical Co	Yes	None in 1971.
11. Houston Pipeline Co	Yes	See Intratex Gas Co.—Permian Basin.
12. Lone Star Gas Co	Yes	See Lone Star Gas Co.—Permian Basin.
13. Pennzoil Pipeline Co	Yes	See Pennzoil Pipeline Co.—Permian Basin.
14. Phillips Petroleum Co	Yes	Arkansas Louisiana Gas Co., Cities Service Gas Co., Columbia Gas Trans Corp., Delta Gas, Inc., El Paso Natural Gas Co., Florida Gas Trans. Co. The Jupiter Corp., Lone Star Gas Co., Louisiana Nevada Transit, Michigan Wisconsin P. L. Co., Mississippi River Trans. Corp., Natural Gas P. L, Co., Northern Natural Gas Co., Panhandle Eastern P. L. Co., Southern Natural Gas Co., Tennessee Gas Pipeline, Texas Eastern Trans. Corp., Texas Gas Trans. Corp., Transcontinental Gas P. L. Corp., Transwestern Pipeline Co., Trunkline Gas Co., United Gas Pipeline Co., Valley Gas Trans., Inc., Western Gas Interstate Co.
15. American Smelting & Refining Co.	No	N/A.
16. Goodyear Tire & Rubber Co	No	N/A.
17. Houston Chemical Co	No	N/A.
18. Olin Corp	No	N/A.
SOUTH LOUISIANA		
1. Continental Oil Co	Yes	See Continental Oil Co.—Texas Gulf Coast.
2. Allied Chemical Corp	Yes	El Paso Natural Gas Co., Lone Star Gas Co., Natural Gas Pipeline Co. Northern Natural Gas Co., Oklahoma Natural Gas Gathering Corp., Panhandle Eastern P. L. Co., Southern Natural Gas Co., Texas Eastern Trans. Corp., Texas Gas Pipeline Corp., Texas Gas Trans. Corp., Transcontinental Gas P. L. Corp., Transwestern Pipeline Co., United Gas Pipeline Co.
3. Monterey Pipeline Co	Yes	Arkansas Louisiana Gas Co., Colorado Interstate Gas Co., Columbia Gas Trans. Corp., El Paso Natural Gas Co., Florida Gas Trans. Co., Kansas-Nebraska Natural Gas Co., Lone Star Gas Co., Louisiana Nevada Transit, Michigan Wisconsin P. L. Co., Montana Dakota Utilities Co., Mountain Fuel Supply Co., Natural Gas P. L. Co., Northern Natural Gas Co., Panhandle Eastern P. L. Co., Plaquemines Oil & Gas Co., Southern Natural Gas Co., Tennessee Gas Pipeline, Texas Eastern Trans. Corp., Texas Gas Trans. Corp., Transcontinental Gas P. L. Corp., Transwestern P. L. Co., Trunkline Gas Co., United Gas P. L. Co., West Texas Gathering Co., Western Gas Interstate Co.
4. Louisiana Intrastate Gas Corp	No	N/A.
OTHER SOUTHWEST		
1. Arkansas Western Gas Co	Yes	None in 1971.
2. Arkansas Louisiana Gas Co	Yes	Arkansas Louisiana Gas Co., Arkansas Okla. Gas Corp., Mississippi River Trans. Corp., Texas Gas Trans. Corp.
3. Western Gas Corp	Yes	Kansas-Nebraska Natural Gas Co., Cities Service Gas Co., Texas Eastern Trans. Corp.
4. Delhi Gas Pipeline Corp	Yes	See Delhi Gas Pipeline Corp.—Permian Basin.
5. Bi Stone Fuel Co	Yes	None in 1971.
6. Lone Star Gas Co	Yes	See Lone Star Gas Co.—Permian Basin.
7. Oklahoma Natural Gas Co	Yes	Arkansas Louisiana Gas Co., Cities Service Gas Co., Michigan Wisconsin P. L. Co., Natural Gas P. L. Co., Northern Natural Gas Co., Oklahoma Natural Gas Gathering Corp., Panhandle Eastern P. L. Co., Transwestern Pipeline Co.

TABLE 18.—INTRASTATE BUYERS IDENTIFIED IN THE 1972 FPC SURVEY OF INTRASTATE NATURAL GAS PRICES (Docket R389A)—Continued

Area and intrastate buyer	Also a gas producer? [1]	Interstate pipelines served in 1971 [1]
8. Oklahoma Natural Gas Storage Co.	Yes	See Oklahoma Natural Gas Co. above.
9. Pioneer Natural Gas Co	Yes	Michigan Wisconsin P.L. Co., Natural Gas P.L. Co., Northern Natural Gas Co., Panhandle Eastern P.L. Co., Transwestern Pipeline Co.
10. Kansas-Nebraska Natural Gas Co., Inc.	Yes	See Western Gas Corp.—Other southwest.
11. Anadarko Prod. Co	Yes	Arkansas Louisiana Gas Co., Cities Service Gas Co., Colorado Interstate Gas Co., Kansas-Nebraska Natural Gas Co., Lone Star Gas Co., Michigan Wisconsin P.L. Co., Natural Gas P.L. Co., Northern Natural Gas Co., Panhandle Eastern P.L. Co., Texas Gas Transmission Corp., United Gas Pipeline Co., Panhandle Producing Co., Colorado Interstate Gas Co.
12. Phillips Petroleum Co	Yes	See Phillips Petroleum Co.—Texas Gulf Coast.
13. Southwestern Gas P.L	No	N/A.
14. The LBA Co., Inc	No	N/A.
15. Coastal Chemical Corp	No	N/A.
16. Oklahoma Gas & Electric Co	No	N/A.
17. Transok Pipeline Co	No	N/A.
18. Reynolds Metals Co	No	N/A.
19. Mississippi Chemical Corp	No	N/A.
20. Mississippi Power & Light Co	No	N/A.
ROCKY MOUNTAIN		
1. Amoco Gas Co	Yes	See Amoco Gas Co.—Permian Basin.
2. Colorado Interstate Gas Co	Yes	See Lo-Vaca Gathering Co.—Permian Basin.
3. Koch Industries, Inc	Yes	Arkansas Louisiana Gas Co., El Paso Natural Gas Co.
4. Koch Oil Co	Yes	See Koch Industries above.
5. McCulloch Gas Processing Corp.	Yes	McCulloch Interstate Gas Corp., Montana Dakota Utilities Co.
6. Mountain Fuel Supply Co	Yes	None in 1971.
7. Southern Union Gas Co	Yes	El Paso Natural Gas Co.
8. Cody Gas Co	No	N/A.
9. Texas Gas Corp	No	N/A.
10. Thomas G. Vessels	No	N/A.

[1] Either the company named or an affiliate.

2. Second, Congress should seriously consider the merits of establishing an independent public corporation to explore for and develop petroleum hydrocarbons on Federal property. The creation of TVA assisted in improving performance in the electric power industry after the discovery of major private corporate abuses in the 1920's. There is every reason to believe that a vigorous, independent, public petroleum production corporation may similarly be a major assist in breaking the monopolistic market power currently in the hands of our privately owned and thoroughly interlocked petroleum companies. Without a competitive threat, they can well afford to move slowly as the growing energy crisis builds support for higher prices. With a viable public corporation that can step in and do the job if they don't, they would be far less likely (or able) to behave like a stodgy cartel. The Federal domain, after all, belongs, quite rightfully, to the consumers of this country, and there is little reason why its mineral wealth should be treated as the private preserve of the big oil companies.

It is true that the rich history of this Nation is steeped in the merits of competitive private enterprise. But when private enterprise is not competitive, it ceases to serve the public, and then it must be controlled, corrected, or replaced.

The corrective measure which must be taken in this regard is to establish a force which will obligate producers to render service at prices reflecting just and reasonable rates. A public corporation, by virtue of the fact that it would provide for an independent alternative source of supply, would constitute such a force. At the present time there is none, and the consequences of this void are serious..

For example, if in response to a supply shortage regulators raise prices in hopes of eliciting new supplies, but the producer combine recognizes that continued shortages may bring still higher prices, regulatory authorities cannot compel them to produce gas at reasonable price levels. Moreover, if conditions develop so that producers have strong reasons to speculate that prices are likely to continue to rise rapidly in the future, there will be strong economic pressure for them to hold off on proving up new reserves until their anticipations are met and further speculation subsides.

There are substantial indications that this is happening at the present time. The FPC has taken a number of significant steps to increase new natural gas prices in the last two years, but proved reserves have not grown appreciably. They have declined. The result is that now the industry trade press talks about the imminent likelihood of future prices double those that have been instituted recently, which are, themselves, double those that prevailed only a few years ago. In an economic climate such as this, it is seldom the case that those who hold the valuable and rapidly appreciating assets are in any hurry to liquidate their holdings. Why sell today when the price is X, if tomorrow it will be X^2?

Thus, regulation is a scissors with one blade—fair rates can be established, but if producers decide to hold out, regulators have little authority to rectify the situation. I should hasten to note that this discussion of the institutional failures of producer regulation is not intended to whitewash the way in which the institutions, as weak as they are, have been implemented. In all candor, implementation too has had its shortcomings. Even if legislative or other institutional restrictions prevent or inhibit the effective implementation of the most efficient public policies, it is nevertheless possible to identify those roadblocks and to work aggressively for their removal. That is one of the purposes of this testimony.

In any event, it should be rather obvious that it is somewhat unfair to expect outstanding results if the tools provided are inadequate to the task, and it is perhaps also unfair to expect great enthusiasm from those assigned a task if the overriding conditions make that task next to impossible. In short, regulation and regulators could be far more successful if the institutional blockages noted here are eliminated.

3. Third, it would, of course, be possible to attempt to deal with the anticompetitive features of the petroleum industry through the passage of new antitrust legislation or through the vigorous and creative implementation of existing antitrust statutes. That this will be done without a Congressional mandate and sustained popular support seems unlikely. The situation described herein has existed for some time, and the Justice Department and the FTC have long maintained their supine position at the feet of the oil industry, arising feebly from time to time to nip at a stray hair, but not since 1911 arousing enough muscle (or a remedial plan) to take on the real task that is required.

Under the present leadership the Antitrust Division, if allowed, may be able to carry forth the required effort. But that would be possible only with the strongest conceivable Congressional support. It has been said that the celebrated IBM antitrust case is now absorbing a great bulk of the Antitrust Division's best resources. To assess the present problem in perspective, one must recall that in 1967, IBM ranked behind Exxon, Texaco, Gulf, and Mobil in total assets, not to mention Chevron, Amoco, Shell, Tenneco, and Phillips, which come right behind, and the others that will have to be taken on simultaneously if the required burden is assumed. No one familiar with our recent antitrust track record could be overly optimistic about the outcome without some new manifestation of the strongest possible Congressional support.

Summary, at this point, is quite simple. The industry is not competitive. Present regulation is not working well. There are a myriad of ways in which competition can be increased: reforming the Interior Department's leasing practices; establishing a viable independent public corporation; vertical divestiture by producers of oil and gas pipelines, and by refiners and gas pipelines of their producing and marketing operations; splitting up of all but the most essential joint ventures, and, where they remain (e.g., utilization of producing fields for conservation purposes), adequate public safeguards; some horizontal divestiture of the largest producers, refiners, and marketers; and there are others. In order for these reforms to be meaningful, they would have to be many and thorough. There are also ways of improving regulation: closing the intrastate regulatory gap: obtaining more and better corporate information so as to be better able to ascertain producing costs; the establishment of a clear understanding that just and reasonable prices should fairly reflect no more than the costs of efficient operations plus a reasonable rate of return; and perhaps formal institutional divorcement of the investigatory and public advocacy functions of regulatory agencies from the ajudicatory functions.

There are two "solutions" which are clearly "bad"; continuing as is as if no change is needed, and turning control over the private monopolists.

I believe that essential regulatory improvements are needed first: they are the easiest to agree upon and can be implemented more rapidly. At the same time, if it is possible, we should begin the long hard, process of restructuring the petroleum industry, so as to reform the underlying market structure and, hopefully, make it workably competitive. But that is a long-run goal, not to be confused with the "free market force" rhetoric which flows on like mana, as if unmindful of the facts and unwary of their consequences.

THE NATURAL GAS INDUSTRY

(Competition and Concentration)

THURSDAY, JUNE 28, 1973

U.S. SENATE,
SUBCOMMITTEE ON ANTITRUST AND MONOPOLY
OF THE COMMITTEE ON THE JUDICIARY.
Washington, D.C.

The subcommittee met at 10:15 a.m. in room 2228, Dirksen Senate Office Building, Hon. Philip A. Hart (chairman of the subcommittee) presiding.

Present: Senator Hart.

Staff present: Charles E. Bangert, general counsel; Bernard Nash, assistant counsel; Patricia Bario, editorial director; Janice Williams, chief clerk; Peter N. Chumbris, minority chief counsel; and Stanley Hackett, minority counsel.

Senator HART. The committee will be in order. Those who were with us yesterday witnessed the inconveniences that were caused our witnesses, and indeed the unsatisfactory nature of the hearing because of the almost constant interruption due to action on the floor of the Senate. And today, I apologize in advance. I think this will be—at least later in the day—even worse. Also, at some point during the day—and it's impossible to know when—I will be required to handle an amendment on the floor. And at that time, we'll simply have to recess for so long as the debate on that amendment goes on.

And with that unhappy prognosis, I will ask the witnesses, if at all possible, to attempt to summarize their testimony. Our first witness today will be Mr. Monte Canfield, Jr., who's the deputy director of the Ford Foundation's energy policy project. Mr. Canfield is accompanied by Mr. Charles Eddy. Good morning.

I should explain for the record that from 1969 until 1972, Mr. Canfield was in charge of the Department of the Interior's mineral resource leasing program, and prior to that, had been with the Office of Management and Budget. Mr. Canfield, welcome.

STATEMENT OF MONTE CANFIELD, JR., DEPUTY DIRECTOR, ENERGY POLICY PROJECT, FORD FOUNDATION, WASHINGTON, D.C.; ACCOMPANIED BY CHARLES EDDY, STAFF MEMBER

Mr. CANFIELD. Thank you, Mr. Chairman, for the opportunity to appear before you today.

I have with me Mr. Charles Eddy, of the EPP staff. Mr. Eddy has been concerned with Outer Continental Shelf resources development for a number of years, and has helped me prepare this statement.

My remarks will be limited, generally, to some of the more important implications of possible decontrol of wellhead prices if applied to natural gas obtained from offshore provinces.

I have been associated for the past several years with the problems of offshore oil and gas leasing and development, both while working with the EPP, and previously as chief of the Division of Energy and Minerals of the Interior Department's Bureau of Land Management.

After some brief observations about the impact of price on the demand for natural gas, I will limit my statement to the issue of price controls on future gas to be obtained from the Outer Continental Shelf, the OCS.

My views on these issues do not reflect the findings of the Ford Foundation's energy policy project. When the results of our work are complete, I may well change my mind on this and other issues.

As a nation, we are faced with a number of serious energy resource policy issues. While many of these issues are fairly evenly spread throughout the economy, others are more nearly the province of a limited number of actors.

For example, the best estimates available indicate that well over 50 percent of the remaining energy resources in the United States are under Federal public lands. Development of similar resources under State and private lands will be influenced by Federal Government policies.

Proponents of decontrol of natural gas prices put forth a rather basic economic argument. They theorize that the Federal Power Commission's control of wellhead prices is an unjustifiable constraint on the marketplace.

Wellhead prices, it is argued, have been held artificially low while demand for natural gas has continued to rise, a result itself due in part to the low gas prices.

Both the supplies of natural gas and the demand for it are assumed to be relatively "elastic," to use the economists' term. That is, with an increase in price an increase in supply, coupled with a reduction in demand, will result.

If normal market factors are allowed to come into play, decontrol proponents argue, the market will clear. That is, supply and demand will come into an equilibrium state at a higher price.

Two basic arguments have developed in support of this thesis, each concentrating on a separate aspect of the supply-and-demand equation.

The first is what I would term the "higher price equals lower demand" proposition. In addition to believing that increased price will result in decreased demand for natural gas, supporters of this argument feel that more efficient use of natural gas will result from higher prices, principally because large industrial users will find gas too costly for "under boiler" and similar uses, and will therefore switch to other fuels.

The beneficiaries are seen to be smaller residential and commercial users who will be assured adequate supplies, albeit at higher prices. I am skeptical of this "higher price equals lower demand" theory. Such an argument assumes a free and competitive market in which price can act as the single pivot and clear future transactions.

One key, of course, to any such clearance, is whether or not there are other sources that can be used. Experience to date with the Clean Air Act indicates that fuel switching might not be a reasonable expectation.

Clearly, industry cannot use oil or coal if the environmental constraints preclude it. What if they can't burn oil and coal to meet air quality standards? Most utilities now claim this to be the case, and future burning of coal depends heavily on new technological development.

Low sulfur oil is also in short supply, as short as natural gas. In fact, oil in general seems to be fairly fully allocated, what with heating oil shortages last winter and gasoline shortages this summer.

So, it seems to me, demand in this case occurs in an imperfect market, one constrained at least as much by air quality laws and the lack of environmentally suitable alternative fuels at anything like reasonable prices, as by the price of natural gas.

However, if it were determined that price, indeed, would help curb demand, the increase could be in the form of a tax, either on the producer or the end user, which might in turn be used to develop better information on additional natural supplies or to finance research and development on new supplies from coal and hydrogen.

If, on the other hand, as I argue, the market is imperfect, certain other options to at least allocate supply among the demanding publics should be considered, includinging possible end-use controls applicable both to interstate and intrastate markets to assure that available supplies go to certain classes of users first—for example, to residential and commercial users—or that they not go for certain classes of industrial use, such as the generation of steam and/or electricity.

Now, the second decontrol argument takes what I call the higher price equals greater supply perspective. This is the thrust of the President's 1973 Energy Message and is also the stated view of the oil and gas industry.

This position is based on the argument that artificially low prices have greatly reduced the incentive to explore for and develop new reserves of domestic natural gas. The additional dollars from higher gas prices, it is argued, will not be windfall profits to the industry, but instead will be plowed back into increased exploratory efforts for natural gas, which in turn, will increase supplies.

How well can this argument be supported? There are several important variables which must be examined. These include the geographic location of the resources, principally whether they are offshore or onshore, and whether they are likely to be in or near the Atlantic coast, the Gulf of Mexico, the Far West, or Alaska.

It's important to understand that there are wide divergences in the estimates of the potential remaining supply of gas in this country. For example, in 1973, the Potential Gas Committee placed this figure at 1,146 trillion cubic feet of natural gas, while in 1972 the U.S. Geological Survey estimated the figure to be 2,058 trillion cubic feet.

Now, of this, the Geological Survey estimated that there are potentially 844 trillion cubic feet in the United States offshore areas out to 200 meters, which would include the Outer Continental Shelf. However, both the Geological Survey and the National Petroleum Council agree that about 40 percent of the remaining domestic resource gas production could come from offshore areas, including the Outer Continental Shelf.

Therefore, given its potential significance, gas pricing policies for the Outer Continental Shelf should be given special attention. The following points regarding decontrol of prices for gas from the OCS must be addressed.

First, the nature of the resource as it is found in place. Second, the existing and projected competitive situation for OCS leases. Third, the ability of the Federal Government to evaluate new regions and make them available for leasing and production. Fourth, the type of exploratory activity conducted by the companies. And fifth, the limitations on companies in bringing new regions into production.

In managing the Outer Continental Shelf, the Interior Department makes no legal or managerial distinction between oil and gas. Leases entitle the lessee to produce either oil or gas or a combination of both.

Now, in fact, natural gas is usually found in combination with oil, in which case it is referred to as associated or associated-dissolved gas. It may be found in gas deposits only also. Then it is called nonassociated gas.

When gas is associated it must be developed in conjunction with the oil. Traditional conservation practices dictate that the gas be retained in the geologic structure to help maintain field pressure and assure maximum possible recovery of the oil.

As the oil is produced, a certain amount of the gas is produced as well. But it cannot normally be developed until after production of oil is well underway if it would in any way detract from the optimum recovery of the discovered oil.

Now, this leads to an overriding issue which must be carefully addressed, whether exploration for new resources on the Outer Continental Shelf can or will be specifically limited to gas, and whether companies are likely, in fact, to pursue such a course of action.

This issue is called, in the jargon, "directionality." Now, if you drill for gas solely with the hope of finding gas, not oil, you are drilling directionally for gas. Needless to say, it's a most difficult issue to come to grips with, a combination of geologic prescience and motivational psychology.

A friend of mine has put it "After studying directionality for about 20 years, I concluded that if a man drills in the middle of a gas field, he is drilling directionally."

So, while we can never be sure of the motivations behind any decision to drill, we can get important clues by looking at the probability of finding nonassociated gas in a given area.

Only if large deposits of nonassociated gas exist under the Outer Continental Shelf can the concept of directionality come into play. To my mind, the existing information on OCS resources is insufficient to make such a judgment.

In its most recent release, the Potential Gas Committee, a main gas industry voice in estimating gas resources, does not show gas resources in associated or nonassociated categories. However, in its 1972 U.S. Energy Outlook, the National Petroleum Council estimated that nonassociated offshore natural gas resources may amount to 30 percent of estimated domestic resources, exclusive of Alaska.

Considering the critical importance of this issue, it would be useful to compare such industry estimates with those of Government. Unfortunately, as in most other energy data areas, there aren't independently derived published Government figures available.

Accordingly, I asked the Geological Survey to provide some informal "guesstimates." These were derived from previously published

Geological Survey data. They're simply extrapolations of past trends, geophysical information and published data. They are certainly not supposed to be definitive, only illustrative.

They show in essence, however, that only about 10 percent of the remaining unproved potential OCS gas resources are likely to be nonassociated. This is about 4 percent of the total domestic resources, as compared to 30, in the estimate of the NPC.

The vast majority of these nonassociated resources appear to lie in two geologic trends off of the State of Alaska in the Outer Continental Shelf.

I'm not here to argue which estimate is right or which is wrong. In one case we have a formal detailed analysis by industry. The other is only an informal estimate because Government really has no ongoing capability to make such a study on an independent basis.

So, what I am suggesting is that the present data base available to the Government is inadequate to determine whether, in fact, sufficient nonassociated gas exists in the Outer Continental Shelf to support gas only exploration.

Improvement of this data base is an important step in determining whether decontrol should be extended to the Outer Continental Shelf in order to increase significantly the exploration for gas as gas, on the Outer Continental Shelf. Now, this brings us to a very related issue. The pace of exploration and development on the OCS at this time.

Bidding has been highly competitive for recent OCS sales. The last two lease sales are illustrative. In a lease sale held in December of 1972, 132 tracts were offered; 690 bids were received, for an average of about 5.2 bids per tract.

Of the 116 leased, the total high bids approximated $1.7 billion, or about $14 million per tract. In a sale held only 10 days ago, on June 19, a similar situation occurred, in which high bids totaled $1.6 billion or an average of about $16 million per tract for the 104 leases on which bids were received.

The reason I mention these two sales is they are very important in understanding this issue because the tracts were believed to be predominantly valuable for gas production.

Now, to my mind, this is evidence of a highly active bidding situation for oil and gas leases on the Outer Continental Shelf, even when those leases are thought to be largely gas leases.

It is a competitive situation which can be expected to increase rather than decrease as more and more domestic production shifts from onshore to offshore provinces.

Given this situation, and the very substantial bids in recent lease sales, it seems unlikely to me that decontrol of wellhead prices would provide much additional incentive to either explore or develop new OCS regions.

The question that remains unanswered is whether decontrol would significantly increase leasing and development activities leading to additional production of reserves; that is, reserves which would not otherwise come on line.

In connection with this, it is important to understand the nature of the exploratory activities conducted by the companies. Under the existing system, OCS exploration is conducted in two distinct phases.

Geophysical exploration is undertaken to measure the general underlying geologic formations over a wide area. This costly process is conducted using specially equipped research ships.

The costs, when compared to the potential benefits, often prohibit one company from going it alone, and so a large number of companies will group together in a joint venture. The use of joint ventures has assured that adequate funds have been available to explore new OCS areas.

Increasingly sophisticated seismic techniques make it possible to determine with some degree of assurance whether a geological formation is of a type which might contain oil or gas. But not until actual drilling is conducted can it be finally determined that there are resources actually in place and whether or not they are oil or gas or both.

This full-scale, deep exploratory drilling from large rigs takes place only after leasing. Again, the principal question remains, would extensive additional deep exploratory drilling take place that would not otherwise take place in the absence of decontrol?

Both the rate that new areas are leased and the ability of the companies to bring in the equipment to develop the leases has been constraining influences in the past, and will likely continue to be constraining influences in the future.

For example, the energy message calls for a tripling of annual OCS lease offerings by 1979. However, the Interior Department has had considerable difficulty developing a system for managing the OCS in a manner which insures full protection of the public interest.

The resource data base is poor, understanding of the environmental impacts from offshore oil and gas development, especially in new provinces, is highly limited, and the system for regulation of lease operations continues to be subject to criticism.

To triple in 6 years the annual amount of acreage placed under lease while insuring proper management of these public resources will be a task of extraordinary dimensions.

It should be noted here that tripling the acreage offered will not likely triple the expected supply. In the Gulf of Mexico some 20 years of leasing experience based largely on company nominations of tracts means that the best tracts have already been leased, with very few exceptions.

If other constraints such as environmental management preclude or delay movement into new areas, this will, by definition, force more offerings in the known areas of the Gulf of Mexico. The impact of this constraint on reducing supply elasticity should not be overlooked.

Even if the rate of leasing can be greatly accelerated, the companies must be able to bring a sufficient number of drilling rigs into service to explore and develop their leases. There currently exist a significant shortage of drilling rigs. The cost of rigs is tremendous, and the shipyards where they are constructed are full.

Significantly, increased OCS exploration will require many more rigs than can be constructed under present conditions by existing facilities. So, we must ask again whether increased wellhead prices will result in a construction program which will ameliorate this situation any faster than would the incentive of sunk investments of billions of dollars already paid for OCS leases as yet undeveloped.

Further, the simple fact of the matter is that as the air quality law constrains the demand side of the market, so do other, nonmarket, non-price-oriented social goals constrain the supply side.

The Interior Department rightly pays allegiance to difficult-to-resolve public interest goals for OCS lease development: the achievement of a fair market value return for resources offered, the orderly and timely development of such resources, and the protection of the environment in the process.

But any attempt to lease massive amounts of new acreage to open virgin territory of the OCS off Alaska or the Atlantic, or to renew southern California leasing will bring a host of other interests to bear upon the leasing questions, and few of these will care very much about the price.

One again, the market will be severely constrained by important social forces other than price.

In summary, the Outer Continental Shelf may contain 40 percent of more of the remaining domestic gas resources. Seismic surveys in new provinces will be conducted regardless of controls on gas prices. There is little evidence to suggest that decontrol would result in significantly increased exploratory drilling for new gas reserves.

The extent of nonassociated gas in new provinces is at best subject to widely different estimates. Competition for leases is currently intense, and the rate of development is limited by factors which are not directly related to wellhead price control.

It is my judgment that a general decontrol of wellhead prices which would extend to the Outer Continental Shelf resources would be premature until careful study is made of whether decontrol would, in fact, lead to significant increases in exploratory activity and subsequent development on the Outer Continental Shelf.

In the meantime, if there's a mounting concern about the failure of companies to dedicate supplies to interstate commerce, perhaps consideration should seriously be given by the Interior Department that it requires as a lease condition that all natural gas found as a result of drilling on Federal lands be dedicated to interstate commerce for residential and commercial uses only.

Under such circumstances, we would discover at the next sale whether sufficient interest existed to explore and develop the potential oil and gas resources of the Outer Continental Shelf. Thank you very much, Mr. Chairman.

Senator HART. Thank you very much. Let me attempt to summarize, and in doing so, if I have not understood the thrust of your testimony, correct me.

First you tell us that more than 40 percent of gas reserves are located offshore in the Outer Continental Shelf. And except for an area near Alaska, which accounts for only about 10 percent of that total, these reserves are oil associated. That is, they would be developed in connection with or in conjunction with oil.

So if the Geological Survey estimates and assumptions are correct, higher natural gas prices wouldn't elicit additional gas supplies because the incentive to explore and develop isn't dependent upon the price of gas.

And you point to other elements which constrain the ability, substantially. to increase the development rate, whatever the price might be. Is that correct? Is that what you're saying?

Mr. CANFIELD. Senator, that's essentially correct, but a couple of minor changes. We're talking here about potential recoverable resources, not reserves. It's a technical term, but reserves are those resources which are known to be in place, recoverable, and at current prices with existing technology.

The second thing is—the burden of my argument is that these resources would, even given a higher price of natural gas, not appear to come on any quicker offshore, because there seems to be a great deal of competition and activity offshore right now with over some $3 billion in the last 2 years going to OCS leasing.

So essentially, that is the burden of my argument. I think you picked it up accurately.

Senator Hart. And you told us that there is an increasing shift to the offshore?

Mr. Canfield. Yes, sir.

Senator Hart. What is your judgment as to the onshore reserves, whether or not there's a shift away from it? What is your information as to the onshore reserve? Maybe you would want me to say "resource"?

Mr. Canfield. I have very little information on the onshore reserves. I have not studied them carefully. I don't, for example, know what portion of remaining offshore—excuse me—onshore reserves are on Federal lands and which are not. I do know that a sizable amount of the anticipated discoveries onshore are expected to be in the northern Alaska area.

The remaining onshore reserves—there, I used it—the remaining onshore resources yet to be discovered are much more difficult to discover because most of the good areas have already been worked out.

Senator Hart. In any event, most of the future gas supply will come from offshore?

Mr. Canfield. I think there's no question about that. The onshore areas are fairly heavily worked over with the exception of northern Alaska, and the opportunities for discovering large major fields lie primarily on the offshore areas.

Particularly, in addition, after the next one or two more lease sales, they will lie in new provinces which have yet to be opened up and which have serious questions of whether they will be opened up because of environmental constraints.

Senator Hart. To ask this question invites you almost to repeat your testimony and extend it by another 2 days, I'm afraid. But if it's possible to lump an answer, given the potential supply that you described the resource is there, why is there today an inadequate supply of natural gas in the marketplace?

Mr. Canfield. I think I agree with your preliminary statement.

A number of things ought to be considered. If it is true that most of the remaining large resources for natural gas will be found offshore, it should be remembered that after Santa Barbara, there was an extensive moratorium on offshore leasing, and that in fact, the offshore leasing situation has only opened up to a leasing starting in September of 1972. So that we did have a period of time in which offshore leases were not being developed. We also have a situation in which offshore leases in new provinces are not possible.

I would point out this, however, when we were developing an OCS leasing schedule in the Department of the Interior, preparatory to the 1971 energy message, we took a demand estimate and drew a line which was not linear, but exponential—it was curving upward fairly severely—in terms of demand for resources both of oil and gas.

And as early as 1969, late 1969, early 1970, we knew full well that at no rate of anticipated OCS exploration could we anticipate that we would close that gap between supply and demand for natural gas with Outer Continental Shelf leasing.

So it was never anticipated that OCS leasing at any reasonable rate could have closed the gap. And that was 3 years ago. I know of nothing that changed that situation. Today it's going—in fact, the gap is getting wider.

Senator HART. Well, given the kind of question that I asked, I think your answer is better than we even hoped for.

Mr. CANFIELD. Thank you.

Senator HART. Mr. Nash?

Mr. NASH. With respect to the onshore supply, Mr. Canfield, do you have an appraisal as to why production was not speeded up respecting that supply, in order to forestall the shortage?

Mr. CANFIELD. I have no information on that at all.

Mr. NASH. Do you have an appraisal as to whether the returns allowed by the Federal Power Commission, and which I understand to be 15-percent return on investment, and most recently a 27½ percent return on investment in the *Belco* proceeding, provide sufficient incentive or an insufficient incentive to supply required supplies?

Mr. CANFIELD. Both of those figures, Mr. Nash, exceed considerably the amount of average return for the oil and gas industry as a whole the last 3 years, on an annual basis.

Mr. NASH. What do you conclude from that?

Mr. CANFIELD. It sounds like there's some incentive in that.

Mr. NASH. I noted in your testimony that at the last two Interior lease sales you indicated substantial gas tracts were bid for, and companies paid somewhat in the area of $3.3 billion for the privilege of drilling.

Can you relate that to the arguments we've been hearing about inadequate incentives to produce?

Mr. CANFIELD. I think that there's—as far as OCS production, I would have to continue to repeat that given the high competitive nature of the bids—these are averaging $14 to $16 million per tract, per 5,000-acre tract—in these last two sales, which were explicitly designed to open up acreage thought to be natural gas—and as a matter of fact, it's turning out very much to be the case in the December of 1972 sale. The anticipated geologic occurrence has turned up with production to be essentially the same.

I see no evidence in that whatsoever to indicate that there isn't anything except highly competitive incentive to go out and get these resources on the Outer Continental Shelf.

Now, this stems in part because the opportunities for getting resources on the Outer Continental Shelf, for finding large additional resources and proving up large amounts of reserves, are much, much greater than they are onshore, in the lower 48 particularly.

Mr. NASH. I take it therefore you believe future supplies will be coming predominantly from the OCS?

Mr. CANFIELD. Yes, sir. The opportunity—when you go out and put down a drill hole—the opportunity of finding a significant, large find is much greater offshore than onshore in most cases. Now, there are exceptions to any rule, but generally speaking this is true. And I think the bids, the transaction evidence clearly indicates this, are where people are putting their money.

Mr. NASH. The $3.3 billion figure is quite an interesting figure. Can you tell us the rapidity with which companies have worked tracts that they have successfully bid for and paid for?

Are they going into production as rapidly as is possible and bringing supply upon the market, or are they not?

Mr. CANFIELD. The only evidence I have seen indicates that, unlike during the middle and late 1960's when production was held back to the end of the initial lease period, in many instances, if companies can get drilling rigs, they have tended very much to go out and try to produce them before the end of the initial period.

It's possible to receive an extension of your lease for 2 years if you're diligently drilling on the 364th day of the fifth year. And those kinds of extensions have been granted almost automatically in the past.

But right now I do not feel that the constraints—that you ever have to get to the question of whether or not these companies are getting out there as quickly as possible. The simple fact of the matter is that in order to get out there at all they have to have drilling rigs, and they have to have these opportunities tied up well in advance. I don't see any evidence that they're not drilling.

Mr. NASH. You seem to have indicated two different periods.

One period in which you believe they are drilling as rapidly as possible—and that is now—and a prior period when you implied that may not have been the case.

Can you tell me what point in time you think the practices changed?

Mr. CANFIELD. I think that the practices were different prior to Santa Barbara. We then had a 2½-year moratorium on leasing, and there was a great anxiety to get out and get oil and gas on the Outer Continental Shelf when that moratorium was lifted.

I think that the supply-demand situation was much different prior to Santa Barbara. There was not the urgency expected. In 1968 very few people were clairvoyant enough to determine that we were going to have problems with either—any kind of energy supply, let alone natural gas supply at that time.

Mr. NASH. Was Santa Barbara 1970?

Mr. CANFIELD. 1969?

Mr. EDDY. February.

Mr. CANFIELD. February, 1969.

Mr. NASH. Subsequent to that, you believe companies commenced drilling rapidly?

Mr. CANFIELD. Subsequent to that there wasn't any leasing for 2½ years.

Mr. NASH. So, subsequent to——

Mr. CANFIELD. There was, of course, drilling on leases which had been issued prior to it.

Mr. NASH. So we're talking about 1972, essentially, when companies started producing offshore in substantial amounts?

Mr. CANFIELD. Not producing, but drilling with vigor.

Mr. NASH. Drilling. Drilling. Now, can you tell us a little more about the Interior leasing practices and spell out for the record, if you can, the amount of tracts that were held, the amount of acreage that was held by companies under leases, and which were not worked?

You come from Interior. Do you have any information? Does Interior keep records to tell us who's been drilling and who's not been drilling and what the status of leases are?

Mr. Canfield. I do not personally have that information myself. That information should be obtainable because we know, for example, which leases are in drilling status, at what point during the lease term, and whether or not extensions have been granted. It would be a fairly simple process to develop data which would indicate by years of lease how many of those leases were extended and for how many extensions, and over what period of time.

Mr. Nash. Well, why would the companies have bid for large tracts and invested large sums of capital and not rapidly worked the leases?

Mr. Canfield. I have no information on why they make decisions like that.

Mr. Nash. But you know, or you believe that they did make such decisions in the past?

Mr. Canfield. You can't—I can't say what motivations of such decisions are. What you can do is look at the data, at the evidence, and indicate whether or not more companies on the average and on the whole were asking for and receiving extensions in the period of the middle to late sixties than is presently happening.

I don't have that data, but access to that data should be fairly easy to obtain, and I think it would be revealing.

Mr. Nash. When you were at the Interior Department, what were the internal discussions that went on and how were policies made respecting whether requests for extensions should be granted or whether the company should be told "No, we need product, you know, start working"?

Mr. Canfield. Mr. Nash, I should explain that the Interior Department responsibilities in this area are divided between the Geological Survey, which is responsible for the management of the leases after they are issued, and the Bureau of Land Management, which is responsible for developing the leasing schedule, holding the lease sales, and its responsibility ends at that point.

It's also responsible for developing the environmental studies. Now, I was—unfortunately for your question—I was in the other half of the Department of the Interior, so I don't know the answer as to what the rationale for granting or not granting the extensions was.

I wasn't privy to any of those conversations.

Mr. Nash. As I understand the British system, they have a very rigorous work program where they require very rapid development. And if the work schedules aren't met, there are forfeitures. There are penalties, indeed, the ultimate penalty could be forfeiture. Do you think that we need such type of program here in the United States to assure rapid development?

Mr. Canfield. I think vigorous enforcement of a 5-year initial lease period would have very much the same effect. The real question is if you can go in and get extension and then get another extension, the initial period is meaningless.

You see, it takes a little while for them to get out and drill, even in the most vigorous situations. It certainly wouldn't hurt to add production expenditure requirements, drilling expenditure requirements to the lease.

But I really think you would obtain much of what you're looking for with a vigorous enforcement, that if—you know, you either have drilled to production by the end of the 5 years or you forfeit your lease, there's a great deal of incentive to drill to production.

Mr. NASH. Do you know for how long a period of time extensions have been granted?

Mr. CANFIELD. How many extensions can you get, Chuck?

Mr. EDDY. I believe it's almost indefinite. It's a very liberal interpretation of the OCS Lands Act by the Geological Survey. And if you are actually drilling—and that is any type of drilling, exploratory drilling—at the time your lease or your particular extension is due to expire, the lease is extended by, I believe, a 2-year term. But I would have to check that.

Mr. CANFIELD. I know the terms are 2 years. I not privy to how many extensions. I'm acquainted with situations in which 9 years from the initial issuance of the lease have taken place before there was vigorous drilling on the tracts.

Mr. NASH. Let's turn to the question of costs for a moment, since that seems to be relevant to what price consumers might have to pay and whether producing companies are getting a fair return.

Based upon your work, can you give us an indication as specifically as possible, respecting what the costs are on a unit basis for offshore gas?

Mr. CANFIELD. Mr. Nash, I can't give you estimates of what they are. As far as Government estimates go, or Government analysis of the costs, when we were working in this area we used to read the Oil & Gas Journal.

Mr. NASH. Do you mean when you were working at the Interior Department the Interior Department did not develop independent cost estimates?

Mr. CANFIELD. They did not develop independant cost estimates that I was privy to. There is no requirement to develop independent cost estimates for drilling.

When I was in that division of Bureau of Land Management I asked some of our economists to try to develop some cost information, but in essence they then fell back on the fairly typical situation which is you look at secondary industry data.

The Geological Survey does not require a submission of cost information on drilling for Outer Continental Shelf leases. To my knowledge they also use industry data.

Mr. NASH. You're pretty far along now, I think, in your energy policy project. In that connection have you come up with anything you would consider to be reliable cost data so we can assess just what costs might be?

Mr. CANFIELD. I'm afraid not. We're, say, halfway along or three-quarters the way along in terms of time. I wish I could say we were that far along in terms of a product. The typical situation where time is running out before the product arrived.

We don't have information in this area yet. I will say that we're doing a series of analyses on the structure of the energy industries and on the various economic aspects. And we also will be initiating this summer a study of Federal resource management programs, with an emphasis on the Outer Continental Shelf. Mr. Eddy is going to conduct that study with the help of consultants.

Mr. Nash. If a firm is drilling primarily for oil offshore and discovers gas, what might be the approximate additional cost of developing the gas by order of magnitude?

Mr. Canfield. I don't really know. It can't be very large.

Mr. Nash. You say it cannot be very large?

Mr. Canfield. It cannot be very large. The question, of course, is the relative location of the particular well to existing pipelines so that you can plug in.

To this extent the Geological Survey—when this issue came up back in 1970 or so—did a number of analyses as to the number of wells which were shut in. And the criteria they used was 10 miles or more from an existing pipeline. So, there may be a clue in that as to where the cost break was, at least in 1970.

At that time it, as I recall, was under 150 wells that they indicated were shut in. The problem with that is that it's not really relevant how many wells are shut in. It's relevant how big the fields are underneath those wells. And there wasn't any data available in that area. So, you could say only 130, 150 wells are shut in that are more than 10 miles from an existing connection. But that doesn't tell you a great deal unless you have a pretty good estimate of potential reserves there. And again, that situation is prior to drilling. It's very difficult.

Mr. Nash. In the past we've had estimates furnished by the American Gas Association respecting available supply and, of course, by the Potential Supply Committee.

Most recently, the Federal Power Commission filed a report in May titled "National Gas Reserves Study."

Based upon your experience, do you consider that the Congress has sufficient reliable gas reserve information upon which to make policy decisions?

Mr. Canfield. No, sir. I think that the burden of my testimony was that in the particular area in which I have some expertise, and in an area in which we are moving for oil and gas drilling, I am convinced at this point that I, for one, would not be able to make a recommendation in this area based on the data we have available.

Mr. Nash. We've had people tell us the FPC's National Gas Reserve Study, you know, is a tremendous work verifying the substantial amount of the shortage that exists, and other people have told us well, it's got all kinds of problems. It wasn't really independent, and if you compare the internal company estimates of gas supply, why they differ by 1,000 percent and more from what they revealed to that study.

Do you have any appraisal of the differing views respecting the validity of that particular survey?

Mr. Canfield. No, sir, I do not.

Mr. Nash. Changing the subject for a moment, we've heard a lot of statements—not necessarily at this hearing, but throughout—that environmental constraints play a large role in preventing development of adequate gas supply, especially in the offshore area.

Can you give us your appraisal about the extent to which environmental constraints have exacerbated the natural gas supply shortage?

Mr. CANFIELD. The situation, again, prior to Santa Barbara, was such that it would be very difficult to argue that any leases which were obtained prior to Santa Barbara and not part of the restricted Santa Barbara leases were not developed because of environmental constraint.

In other words, those leases were already issued, a contract existed, and there would be no reason to assume that those leases shouldn't be developed.

There's no question in my mind that environmental goals which are social goals of this Nation, will in fact constrain future leasing, especially in situations in which oil and gas are leased together because you can't convince someone who lives on Cape Cod that you're going to be able to put a drill bit down and not come up with any oil.

And as long as you have some probability that you'll come up with oil, and as long as most of this gas is associated with oil, you're going to have considerable constraint placed upon the drilling for that gas.

Mr. NASH. As I understand your testimony, you indicated that we have substantially more drilling going on post-Santa Barbara than pre-Santa Barbara however.

Mr. CANFIELD. Yes, sir.

Mr. NASH. Does that mean that while we may not have reached the maximum limit that we could have, we do have substantially more drilling going on now despite environmental constraints?

Mr. CANFIELD. Where the drilling takes place is critical. In the Gulf of Mexico, off the provinces of southern Louisiana and eastern Texas, the people there want this drilling. So that the real question then is that you can't look at the OCS in general or in the abstract.

You've got to look at where the resources are likely to come from in the future. To the extent that there's any logic in my testimony—that the better areas of the Gulf of Mexico in the traditional known areas are already drilled, to the extent there's any logic in that testimony, it would imply to me that you must then move to virgin areas.

I find it extremely difficult to see how we are going to move rapidly into drilling for oil or gas or anything. In the areas off the Atlantic, the Gulf of Alaska has enormous environmental and geologic problems. The Santa Barbara area is obviously verboten. The question of beyond the Channel Isles in southern California is getting a lot of local concern. And it just strikes me that to assume that we'll just simply be able to say, "There is a gas shortage. Therefore, we will open up the Federal domain and we will solve the problem" is just unrealistic, wholly unrealistic.

Mr. CHUMBRIS. If I may interject, Bernie, I guess it was around New Year's this year, early part of the year, I happened to be in New Orleans checking on the very problem we're talking about.

I was talking to the people in the Interior Department at New Orleans, and it appeared that several Congressmen and Senators and public officials from New England were going down to New Orleans to see how they were meeting the problem of offshore drilling, because of the environmental complaints.

And the understanding that I received from these Interior Department people was that the officials were almost astounded at the way they saw it in New Orleans—the offshore—and the way it was portrayed to them in their area. And some of them were impressed because the idea, as you pointed out, the people off New England may be against the idea of offshore drilling because of the environmental problem.

It was rather interesting. I don't know what the complete development of that project was, and how well it carried when these people went back home. But they went to the trouble to go down to New Orleans to see how it affected the environment in that area.

Mr. CANFIELD. Yes. I'm familiar with that trip. And I think they also went out to a so-called "clean-refinery" in Washington State and looked at it and were very impressed with that.

I would simply say that it doesn't appear yet that there is an overwhelming groundswell to lease off New England. I testified last week before the Massachusetts Marine Boundary Commission. and the oil representative was given a very hard time at that hearing.

Mr. NASH. Let me ask you one competitive question and one wrap up question. Based upon your extensive experience and your knowledge of the industry, do you consider the natural gas producing industry to be workably competitive so as to render unnecessary the need for Federal Power Commission regulation?

Mr. CANFIELD. My initial judgment, not based on analysis, is that the answer to that question is no. We are doing an analysis today of the structure of the industry, including the structure of the natural gas industry. And it's possible that in the next 6 months I will change my mind, because that study is just now underway.

We will also be looking at the behavior of that industry in terms of the competitive or noncompetitive nature of it.

Mr. NASH. Your answer in the negative meant that you do not consider the industry workably competitive? Is that right?

Mr. CANFIELD. I don't—you asked, in essence, is it sufficiently competitive—I thought you asked is it——

Mr. NASH. It was a double negative, and I apologize.

Mr. CANFIELD. Is it sufficient——

Senator HART. The question is, Is there a level of competition in the industry sufficient that we don't need FPC intervention?

Mr. CANFIELD. My preliminary judgment on that is that we do need price control.

Mr. NASH. What can we do to get sufficient quantities of natural gas now, without paying monopoly prices? Do you know?

Mr. CANFIELD. Well——

Senator HART. That starts us all over again.

Mr. CANFIELD. I think if I knew the answer to that I could run out of here and sell it somewhere.

I think the answer, in part is, to my mind, we are not going to be able to get sufficient quantities of natural gas to meet the demands that we are now anticipating.

If we insist on continuing on the traditional American gluttony of energy consumption, we will have mini-gas shortages, mini-gasoline shortages, and we will continue to go from one mini-crisis to another.

The real solution to this issue is something we were not particularly asked to address here, and I'll try to be very brief. We need a two-phase program of conservation of these energy resources, coupled with research and development to develop gas supplies from substitute sources, such as coal, gasification of coal, and potentially, at a later date, the use of hydrogen for our gas supplies.

Until we've got the kind of research and development effort to come up with these substitute sources I think we're going to be in for hard times as far as natural gas goes.

Mr. NASH. Thank you.

Senator HART. Mr. Chumbris?

Mr. CHUMBRIS. Thank you, very much, Mr. Chairman. I have no questions for Mr. Canfield. He stated very clearly that these views are his own views, that the project has not yet been completed, and when the results of the work are completed, and I'm quoting you "I may well change my mind on this and other issues."

Another thing significant about Mr. Canfield's statement is the fact that he prefaced many of his answers to statements that other people have made, which, in a sense, gives us two viewpoints, the viewpoint you've used as your basis, and then your reply to it, which is the type of thing I think that we need in hearings so anyone who reads the record will feel that it's a one-sided issue until possibly the next round, when the other side will have their opportunity to respond to many of these very, very significant issues.

And we appreciate very much your coming, both of you, Mr. Eddy and Mr. Canfield.

Senator HART. Gentlemen, thank you.

Mr. CANFIELD. Thank you, Mr. Chairman.

Senator HART. Let me suggest a recess for just a few minutes here.

[A brief recess was taken.]

Senator HART. Our next witness is one who knows the Hill so well that he probably expected to have the hearing messed up this way.

We do welcome him, and included in his earlier experience, of course, he was the Chairman of the Federal Power Commission. He is Mr. Lee C. White, and today he is appearing as chairman of the energy policy task force of the Consumer Federation of America.

Lee, I am sorry we had to take that interruption.

STATEMENT OF LEE C. WHITE, CHAIRMAN, ENERGY POLICY TASK FORCE, CONSUMER FEDERATION OF AMERICA

Mr. WHITE. Mr. Chairman, the vicissitudes of this business are, as you say, well known. I think the subject is sufficiently important that no one could be offended at delay of any type at all.

I would hope, however, that the delay for the witnesses would not signify any further delay on the part of Congress in acting on some of these issues.

One of the distressing aspects of the energy situation and certainly the natural gas situation, is that we have not really just discovered it this year or last year or the year before.

There have been some specific proposals, and I think that we could perhaps plan to have an additional year or two of hearings and debates and reports and conferences and symposiums: but I think we are really way beyond the time when we should have acted.

Although I am jumping to the end of my statement, it really is a plea for some action from Congress. I think that is where the action belongs.

If I may now revert to the beginning, I will, if it is agreeable, ask that the full text of my statement be included in the record, but it is entirely too long to read and I would rather just hit some of the high spots and then go to some of the points that, in addition, I would like to make as a result of hearing the questions here this morning.

Senator HART. The record will contain the statement in full.

[The document appears at the end of Mr. White's testimony.]

Mr. WHITE. I am here in my capacity, as you suggest, as chairman of an Energy Policy Task Force of the Consumer Federation of America.

We have come into being and represent about 15 major national organizations, some with very large memberships. The purpose of our organization is to see to it that a consumer's voice is involved in the policy debates that are now going on.

We are not so presumptuous as to believe that we know the mind of every consumer or that consumers' positions do not have conflicts.

Yet our base and our bias is consumer-directed. We believe it is appropriate for you to hear from the industry, from the Government, and also from those of us who undertake to speak from consumer viewpoints, recognizing the qualifier that I mentioned.

My past experience as chairman of the Federal Power Commission has also some relevance here, and in my formal statement I have undertaken to set forth what I regard as some of the basic factors that have contributed to the shortage.

I do not happen to subscribe to the basic suggestion offered by many that the reason we have a national gas supply imbalance, or shortage, is because the Federal Power Commission kept prices "artificially low" during the Kennedy-Johnson era.

I simply do not think that is the case, and those factors are spelled out in my prepared statement.

If when I am finished there are questions, I will, of course, be glad to elaborate on that point.

I think it is worth spending just a few moments on the frustrations that the Government and particularly the Federal Power Commission has when it deals with the industry that it is expected to regulate in accordance with the Natural Gas Act of 1938.

The fundamenal problem that I was aware of when I was with the Commission was the lack of adequate data. It is extraordinarily frustrating, I can tell you, Mr. Chairman, to have the responsibility for setting rates and not believe that you have adequate and accurate data.

The statute does not say anything about your putting off the responsibility of setting "just and reasonable"—which is the statutory phrase—rates until you can get the data.

You really have an obligation to keep moving, and it is quite painful to have to set those rates and feel that you are operating somewhat in the dark.

Adversary hearings went on for years to provide the data for the Federal Power Commission to use in the major area rate case that I participated in, the *Southern Louisiana* rate case.

I think there were probably 3 years of adversary hearings, in which the focus was on such items as the elements that constituted the cost of producing the gas, with over 30,000 pages of transcript, with the hearing examiner's 100-page recommendation. Then the Commission went about its job.

We sat in a Commission hearing room and had before us what I thought was a competent staff, some of the people even gifted. One of the best was a fellow by the name of O'Leary, John O'Leary, who had come from the Interior Department and subsequently became director of the Bureau of Mines and is now an official of the AEC.

He was then the chief of the Bureau of Natural Gas, and the question put to him by the members of the Commission, who were honorable men trying to do a tough job, was, "Jack, if we raise the price 1 penny, how much gas will be elicited, how much additional gas?"

He said, "I do not think any."

"Well, how about 2 cents?"

He said, "No, I do not think so."

"Well, then, how high do we have to go before more gas will come?"

He said, "That is a very difficult question."

I said, "I know, but we have a difficult job. How are we going to handle that?"

The answer was, "There is no way."

And I gather that was the testimony of the current chairman before you earlier this week.

That does not mean, I think, that regulation ought to be scrapped because it is difficult. I think what it signifies to me is that we need to take a look, first of all, at the system and, above all, more information.

I cannot be sure, but I have a hunch that the testimony you had yesterday from the Federal Trade Commission, Mr. Halversen, may be the most important testimony you have had in a very long time. It sounded like a blockbuster to me, and I have been extraordinarily cautious and conservative in responding to the question of "Is there a conspiracy?"

My formal statement today takes that very cautious line, because that is a heavy charge to level at anybody, and I do not think it ought to be done lightly.

Yet, I must say, when I read Mr. Halversen's statement this morning, I think that the Federal Trade Commission ought to be, if anything, not unleashed, but prodded even more.

I know that you take some comfort in the fact that it has been this subcommittee that initiated the inquiry. Even though it has dragged on for a couple of years, at least you are beginning to see some fruits of it. I hope that it can be accelerated, because it is critical.

The problem that you posed for Mr. Canfield was—assuming that everything you have heard is right, how are we going to get more gas in this country?—a fair question and a tough one, but I think that is really one of the important elements of this entire energy discussion.

Putting it in general terms, it seems to me there are a few things that might be done.

The first is to make sure that the supply that we do have, that is available, is used better. In other words, we can, in effect, generate or find or have or secure additional gas by diverting it from where it is now being used if there are acceptable substitutes, and if we are able to slow down or reduce the growth in the use of it.

For example, I think that it is a national disgrace that natural gas can be used in some States where it is produced for the most inferior of uses—namely, to fire boilers for any purpose; for example, to generate electricity—if there are alternative fuels that can be used.

So it seems to me that one of the considerations is to focus on what was put into the Natural Gas Act in 1938 as a rational approach; namely, a distinction between interstate and intrastate gas.

I think if it made any sense then, it certainly makes none now. When you have a scarce resource, it ought to be regarded as a national resource.

People in Oklahoma and Louisiana and Texas, I think, understandably believe that they ought to have the benefit of their natural resources and that they should not be required to spread their resource, natural gas, across the Nation.

When, as now, we are in a critical situation, however, I think that principle fails in considering the greater national need.

Then, too, may I say, they do have some advantage of location. Gas that costs 20 cents in Oklahoma can be purchased by Oklahoma consumers a great deal cheaper than it can be in New York, because they do not have to pay the transportation charge. Of course, the people in New York will be paying the transportation charge.

I think, in short, one of the suggestions that I would make which will not produce more gas, but I think will help us use it better, more efficiently, would be to eliminate that distinction between interstate and intrastate gas.

I am pleased to note that your colleague, Senator Griffin, last year introduced a bill that would accomplish that, and has reintroduced it this year. I hope that the Senate Commerce Committee which has jurisdiction over that bill will soon hold hearings on it, because I think it has something to offer.

Next, I think that we do know that there are some resources available to the Government. We do know that right now the Government is frustrated. There is no authority that anybody is aware of that would permit the President or the Secretary of Interior, the Federal Power Commission, the Federal Trade Commission, Congress—through any individual or a committee—to require companies to go out and drill for oil and gas. It is simply not the way the industry is structured.

I do not know that we are at the point in time yet where the industry ought to be made a public utility. There are people who think of gas as a public utility comparable to or analogous to electricity. It is not quite that way.

A utility, I am told, in New Jersey was told that they had to build an additional generating station. They said, "Well, yes, it probably is necessary, but we do not think we are going to be able to get around to that until the State Commission has acted on our application for a rate increase."

The New Jersey Board of Public Utilities Commissioners said, "Well, that is very interesting. Perhaps we had better get somebody else to handle that franchise."

And the utility said, "Well, really this can be worked out."

The point is that, in addition to having the rights and the benefits of serving in a monopolistic situation, the utility had the obligation to provide service. There is no corresponding obligation on the part of the producers of natural gas.

The distributors of natural gas have every obligation to attempt to get as much gas as they can to meet the needs of the area they serve. But you cannot mandate the impossible. They can only do what they can do, although may I say I have a few unkind words to say about distribution companies, too.

I think that simply because the wheel turned in the late sixties, about 1968, when they stopped being buyers in a buyer's market and became buyers in a seller's market, they truly did cave.

I am sure that within the industry there was some disagreement as to the wisdom of that course, but I dare say you will have a great deal of difficulty getting anybody from the distribution industry to come in today to tell you what they think is wrong with the producing industry, so long as they want to buy gas from the producers.

I am not sure I would be quite so brave either if I happened to be the head of a distribution company. But I think that that is important to understand the dynamics that are taking place today and which, I think, in part explain why we are in the situation where we are.

So one alternative—and I do not necessarily advocate it—is the public utility format which says that somebody can compel a certain percentage of investment from profits or a certain dollar volume of drilling each year by the major petroleum companies which, after all, exercise a very important role in our economy and in our way of life.

Certainly even before that, there is the possibility of nationalization. I do not think nationalization of the industry is called for. I do not think it is desirable, and I believe, realistically, it is politically impossible anyhow. I would not advocate it.

One approach that has been bandied about—I do not think it is particularly likely to catch fire, but at least for the purposes of the record let me mention it—is the one that goes something like this:

It is very difficult to tell what the right price of natural gas ought to be in advance. The industry says, "Put it high enough, and the higher it is, the greater the incentive, and chances are we will reach a balance one day between supply and demand."

Well, we are in a sort of critical or perhaps even in a crisis situation. During World War II we believed we had to fire up our economy in order to wage a war, so we said, "Go to it, industry." But, in fairness, it is almost impossible to know in advance what is going to be the right price. We do not want you to make a killing, a windfall. We do not want you to be underpaid. We will have a concept known as renegotiation of contract after the fact.

"You bring into us all of the data you have, because you are entitled to a fair, reasonable profit, but not an excess profit, especially during war time."

Well, that did not work perfectly, but it worked. Maybe, just maybe, somebody ought to say to the gas industry, "I will tell you what, fellows, would you settle for 18 percent profit?

"If you will, go ahead and whatever you do, you bring your records in and we will see if we cannot work out a mechanism whereby you will be assured of that, but no more."

As I say, I do not necessarily advocate that to you, but it is another notion on the spectrum.

Now I get to the one that I do advocate, and rather vigorously, and that is the establishment of a U.S. Fuels Corporation, a Government-owned corporation that would go into the business of trying to develop the resources that we own, as citizens.

Some of the most valuable resources, as Mr. Canfield suggested, are on public lands that all of us own.

I would like to see a corporation go into the business of trying to find those resources and make them available. I do not believe that it ought to be exclusive. I do not think we ought to say, "No longer shall Exxon, Phillips and Marathon and the others have anything to do."

I am just saying that, in addition to all of those, I would like to see the U.S. Fuels Corporation operating. I think it would perform some very worthwhile functions, and I would like to tick them off very briefly.

First, I would like to see somebody who is motivated not solely by the profit motive. There is nothing wrong with the profit motive, but when that is the dominant motivation, I think sometimes we put a strain on people who are in the business of making money.

If you, Mr. Chairman, or I happened to be the chairman of the board of a major petroleum company and one of our people came to us and said, "We need gas. Let us go in and drill as much as we can," and somebody else said, "Well, if we do, we may find it and we may find it at the wrong time, because it looks like Congress might deregulate, it looks like the prices are always going up, why do it now? What are some of the other alternative places we can put our money?"

In short, I would like to see a board making decisions that maximize the discovery and the exploitation of the resource, rather than the profitization of it.

Second, as I suggested at the very beginning, our greatest frustration is the inability to have adequate data and information.

We are entitled to that information, as the public, and certainly Government and, above all, the people who have some responsibility and interest.

If U.S. Fuels Corporation is in the business, I have a hunch we will get all of its data and information.

You may remember that the United Kingdom entered into a partnership with some oil producers to find oil and gas in the North Sea. When they did find oil and gas, the question was, How much should the British Gas Council itself pay for that gas in order to distribute it to the people in the country?

They set a rate, and when the company said it was too low, the British Gas Council could say, "Well, according to all the data we have, that seems like a just price and here is the proper profit motive based in the data" and that was the end of it.

Now, I am not sure that the experiment is all that perfect and analogous, but I think it is instructive to us.

In short, I do know that if the U.S. Fuels Corporation had information, it would be available to this committee, the Federal Trade Commission, the Federal Power Commission, and the public.

Next, Mr. Canfield suggested that we have some valuable resources offshore, the Atlantic and the Pacific, as well as the Gulf of Mexico. I think that is true.

I think, also, that we will see that that is where the drilling will take place. I will not say that it is inevitable, but to the extent that one can forecast or predict, I think it will happen.

I suspect that the American public, especially the group along the coastal areas who would be most concerned, would have some greater degree of confidence in that type of exploration being undertaken by a Government-owned corporation than by a privately owned corporation.

Again, because profit maximization would not be at the top of the list—and I personally have no objection to the United States Fuels Corporation making money; in fact, I would expect it to make a great deal of money—I would prefer the motivation of meeting a national need.

Nobody has really suggested to us that this is a business where the bankruptcy rate is high and where people go into it and lose money.

As a citizen, I would regard it is a pretty good investment and I would not mind seeing my Government invest in it. I would like to see some of those profits plowed back into research and development and especially in the field of environmental technology and protection of the environment.

I think that it could be done, and I think that there would be some considerable acceptance by the public. I cannot envision any party of community people welcoming the United States Fuels Corporation with open arms. But as compared to Texaco and Exxon and others, I think that such a Government corporation may be more welcome.

Finally, and perhaps most important of all, is the prod to the industry.

The Tennessee Valley Authority did a good job, I think. We can wrangle over whether the rates were set too low and whether they did not return the right amount of income to the Federal Government in lieu of taxes. But I do not think anyone has questioned the technical competence of TVA. If anything, we have now found ourselves criticizing it because it is too much like a private utility, and has not paid enough attention to the environment.

I think that the analogy is there. It has been relatively successful. In fact, just because I understate things, I use the word "relatively." I think it has been a very excellent experiment and successful, and well evaluated as such.

That, then, is another way in which I think we can expedite our securing of the necessary gas for this country.

Another suggestion is the use of the proprietary interest of the United States. The United States owns a great deal of public lands.

I remember one incident that presented itself when I was on the White House staff and the question was, "When an electric utility needs a right-of-way across Federal lands, should that right-of-way be conditioned upon the applicant for that right-of-way, whether it is privately or publicly owned, conforming to some public policy positions that the Government regarded as desirable?"

One of the specifics was the wheeling of power for preference customers.

And the answer that came out of the Kennedy administration was, "Yes. If you are going to use the public land and ask for a right-of-way, then you must, as a condition to that, agree to wheel if we regard that as a useful public policy."

OK, now we go to our oil and gas deposits on the offshore. It seems to me that in setting up a leasing arrangement, it is appropriate to demand of those who would bid and be successful some activities that will be in the public interest, as the Government sees it, and as is promulgated by those who have the responsibility for and interest in whether we have adequate energy resources; not only those that are among the current leasing provisions, but also others.

Again, I would prefer that the Congress require data be made available to the Government. If, for any reason the Congress does not do it head-on, I would like to see it done indirectly by the use of the leasing technique.

May I say on that score, Mr. Chairman, the Federal Power Commission, for the last 14 or 15 years, both during Republican and Democratic administrations, has sought from the Congress legislation which would give it much broader information-gathering authority.

To some extent, I think the Commission may have been remiss, because it was not skillful enough to get the attention of Congress. But to some extent I think that the Congress was remiss in not, in itself, acting on the specific recommendations which were part of the Commission legislative program—and again, this was not partisan, this was done during both Republican and Democratic periods.

In short, though, I would say that we should use our proprietary rights as owners of public lands—the "we" meaning the public and the Government—to see to it that some objectives, if we can agree on them—and I think some are easily agreeable—are fulfilled.

A couple of minor questions in terms of how to get more gas, but perhaps major in terms of how to get more policy—our group does support enthusiastically the notion of a consolidation of energy functions within the executive branch.

We gather that the President will submit a new proposal and it sounds, from what we have read in the newspapers, like a reasonable one.

I would hope that the Congress, itself, could use that as a golden opportunity to take a look at itself. May I say, respectfully, Mr. Chairman, there is nobody—no committee chairman, no subcommittee chairman—who really feels that he is under the gun if we do not have an acceptable energy policy in this Congress.

You can read the Congressional Digest day by day and learn of this hearing—and there will be another one, I am sure, some place else, and some other subcommittee will have hearings—but hardly anybody can go to Chairman X and say, "You know, you do not have a policy."

Now, in education, you know who to get after. In agriculture there is somebody who has got a hot seat. He is either congratulated for having done something or blasted for not.

I am told—I cannot vouch for this—when Congressman Bolling's committee looking into committee jurisdictions had hearings, there were 9 or 10 chairmen who testified before them. Curiously, every one of them asked for more jurisdiction.

I do not have the solution for this. All I can see is a problem, and if there is some way that the Congress can either create a joint Atomic Energy Committee counterpart or maybe give the jurisdiction to it or create energy committees within each of the bodies. I really think it would be useful.

In the past and up until, I would say, 4 or 5 years ago, we really did not think of energy as a discrete problem.

President Kennedy sent a message to Congress on natural resources, and we prided ourselves that it was the first message ever sent by a President on natural resources.

Then, 2 years later, we sent a message on conservation. And then, finally, I think President Nixon got the credit for sending the first energy message, and I think he deserves credit for that.

Energy has emerged now as a first-class problem. It is high on the domestic agenda, and I think that Congress owes itself the obligation to take a look at it and see how it can best handle it.

These problems are not simple, and they do not all break down into single committee responsibilities because, for example, one of the critical elements, which I did not talk about, is tax policy.

Well, obviously, that is not going to be taken out of the Finance Committee and stuck in an Energy Committee. But at least a lot of these functions can be consolidated and centralized, and I urge that that be done.

I think I have said more—I have taken more time than if I had read my statement, but that is the way it goes, Mr. Chairman.

Senator HART. It is really a superb summation.

I have made some notes. At one point I was writing down what I thought would be a question for you to answer. The question was, What price will bring more gas? I am disappointed in not being able to ask it as later you explained that we cannot be sure of that.

On this last point, the goad to Congress, you say let us keep goading the Trade Commission, the Power Commission and, of course, we will.

But you wind up by saying to Congress, "What are you doing about it? How can you get a handhold on the response to the energy problem?"

I do not know how we can. The idea of a joint committee on energy, given all the jealousies around here, may be the most likely to move us in that direction.

But then you immediately make the comment that tax policy has an important influence on both the protection of resources and the development of resources. How are we ever going to get that aspect into a joint energy committee?

Probably never.

Just your recital of the chronology of Presidential messages—if my notes are right, the first natural resources message came from President Kennedy and on that one I am sure you had a hand.

Then you followed with a message on conservation, a first, and President Nixon now comes in with an energy message.

And all three are part and parcel of the same problem, really.

Mr. WHITE. Yes; they certainly are. They are all woven together.

Senator HART. Having said that, they are part and parcel of somebody's committee up here, each; and how you massage the vanities and, at the same time, achieve results, I am darned if I know.

You are right—it has to be done.

Mr. Chumbris says there is a bill in the House to create a Committee on Energy.

Mr. CHUMBRIS. It was just introduced about two weeks ago.

Senator HART. There again, what will it do? From whom will it take jurisdiction and will he stand still, and will it gather?

I mean, this is the problem.

Mr. Chumbris. It was pointed out that it will not conflict with the jurisdictions of the other committees.

Senator Hart. Well, he is sure going to have a very narrow based energy committee.

Mr. White. I guess the way these things normally happen is one of two ways, as I can recall. One is because a problem is of such a character—for example, the development of atomic energy—that it just rises above normal obstacles and has to be done.

For example, the creation of the Space Committee took that route, I think. There was a recognition that everybody had a little piece of it, but it was a national commitment that had been made or was about to be made and the way to do it was to create a new committee.

It takes a lot of political muscle. I think it was Senator Lyndon Johnson who put that together and who, oddly enough, turned out to be the chairman of it.

The other way that these things happen is through general legislative reorganization. Every once in a while, about every 20 or 25 years, the Congress moves and then there is a lot of shuffling around and trading-off and they lop off a few committees and maybe add one.

But I think those are the two principal techniques for achieving reform. I think it is going to be quite some time before the Bolling committee is through and there is a reshuffling.

But we do what we can and, for all I know, there has been some recognition that the character of the problem is becoming so important that something must be done.

If I were a Member of Congress, I think I would want to go back home having voted for some energy legislation, because if the shortage situation in gasoline and fuel oil that we project comes along, just about where we expect it to be, it is going to be pretty bad.

If we get a severe winter, then I tell you, Congressmen are going to have an awful lot of questions put to them by their constituents, and I think fairly, because in our mechanism Congress is the body that makes our policy decisions.

I know the industry is proud of its past performance and believes that the less intervention, the less interference from Government, the better things are going to be and the reason we are in all this mess now is because of this little touch of Federal regulation of the natural gas prices.

But, again, I think if I were a Congressman, I would be just a little bit leery of believing that that is the answer that is going to be satisfactory to the people at home; that, yes, it is those fellows' fault in regulating gas rates.

When we had the big blackout in 1965 in the Northeast, you cannot imagine how many people had to discover where the Federal Power Commission was so they could raise hell with it. People just did not know, and they assumed it was a governmental responsibility.

The Government really did not believe it had much responsibility. My predecessor, Joe Swidler, one of the most able men ever to serve in that post, had to admit that it had not even been focusing on this question of reliability of service very much.

They had just finished a national power survey, and I do not think the word "reliability" had even been mentioned in it. It did not regard that as its function until it went "kaflooey," and then Congress jumped on it, the press jumped on it, and the citizenry jumped on it. And it began to focus on reliability and, hopefully, play a constructive role.

The point, I think, is that private industry does beautifully so long as things go along nicely. When they do not go so well, that is when Government gets looked to.

That is the reason I just ticked off for you a whole series on the spectrum of what the Goverment might do. But I do not think the Government can do nothing, and that it what I am afraid we are about to do.

I want to take one of your principal points of focus, deregulation of natural gas. I think the point that Mr. Schwartz made yesterday and that is in my statement today is that it is really not fair to the industry to leave them kind of in suspense, believing that there might be deregulation and that prices might go up.

It is very difficult to invest under those circumstances, and I do not think Congress ought to decontrol gas rates. But I do not think it ought to not decontrol by default. I think you ought to tell them—this is the way it is going to be.

Let them, either way, know so they can go on about their business. I would like to see some spur and some prod and some competition from a Government-owned corporation.

But basically, I think they are entitled to some kind of an answer as to what the situation is going to be in the next phase of our existence.

Senator HART. You did acknowledge the really heavy responsibility that you would have or I would have if we were the chief executive officer of a major petroleum company.

My stockholders would wonder, perhaps, why I had committed a lot of capital to bringing gas on the market on the eve of what that stockholder believed to be an announcement of deregulation.

Mr. WHITE. Absolutely.

Right now, we are about to see the resolution by the President of a question: Should the allocation of fuel be on a voluntary or a mandatory basis?

The Senate, by a vote of 85 to 10, said that it had to be mandatory. The House has not yet acted. The President, we believe, has authority under the Economic Stabilization Act to adopt a mandatory program if he wishes.

He announced on May 11 a voluntary program, and there has been a lot of discussion as to how effective that has been. It seems to me that it is almost improper, a little cruel, to stick on the head of a big oil company executive the responsibility for doing something on a voluntary basis that he believes and can demonstrate is inimical to the interests of the stockholders, especially if he does not know if his buddy—if they are truly competitive—and he does not know what his buddy down the street is going to do.

Why should he take the lead and find himself exposed, because he may find that next year they want a different type of guy as president.

His whole lifestyle, his whole experience has been developing in maximizing profits, and the test of how good a job he does is that annual statement called P. & L., profit and loss. And it does not say too much about all of the social responsibilities that may have been met.

If the profit figure is good and he has also done a good job environmentally and socially and in minority employment and everything else, then that is fine.

But if those social aspects and existence and life in the United States today are perfect, but he has not got any profits, I think we will find a new executive running that company very soon.

So it seems to me that it is most humane to tell these people what has to be done.

You will be very interested, Mr. Chairman, in an experience that I mentioned to the Oil Policy Committee when they had hearings on this very question.

I was in Attorney General Kennedy's office when he was meeting with a group of chainstore executives mostly from the Northeast, who operated chains that had outlets in the South. These were hotels and theater chains and lunch counters at dime stores, bowling alleys, that sort of thing.

He said to them—this was 1963—"We have come to the stage in our national life where you people have got to take some leadership. We are going to make progress, but if you will take the leadership in the communities in the South where you serve, it will really do the trick."

They said to him, "Well, that is an extraordinary thing you are asking us to do. We do not have any problem with what you are attempting to achieve. But how do you believe we can properly, in an area where we are regarded as outsiders, be leaders and perhaps run the risk of losing money at the same time for our stockholders.

"Tell you what, Mr. Attorney General, why do you not enact legislation that will make everybody do it evenly and uniformly, and we will support it?"

I must say that is pretty appealing to me, and that is what happened.

Senator HART. We used that argument in support of civil rights legislation all through the sixties.

Mr. WHITE. Exactly.

Senator HART. It enables the fellow who wants to do right to say, "I was compelled to do right."

Mr. WHITE. And not to put him at a disadvantage.

Senator HART. If it offends the community's conscience, do not shoot him, be mad at the lawmaker.

In a sense, it is the same theory that was included in the arguments for truth in packaging and lending—make a minimum performance level so that you do not have to worry about what the fellow down the street is about to do to you, either in styling or cutting a corner on disclosure.

Mr. Bangert?

Mr. BANGERT. I just have a couple of questions, Mr. White, to see if we can get some of your expertise based upon your tenure as Chairman of the Federal Power Commission.

This goes with regard to the type of information that the Commission gets in natural gas rate cases. Does the Commission obtain specific reserve data from companies with respect to rate cases?

Mr. WHITE. Well, the answer is yes, but I think you probably want more than that, because do not forget these are—at least the way the area rate proceedings have been held—they are adversary proceedings.

Somebody puts in a case, and somebody else has an opportunity to throw rocks at it, and to tear it apart. So to the extent that the applicant for a rate, the producer in particular, if he wants the rate to be higher, will try to demonstrate why it ought to be higher and why the cost of producing the gas is higher.

But those who believe that it ought to be lower or are neutral and just want to know what the truth is or where they believe the truth to lie, will then have an opportunity to take him apart.

So to some extent it depends upon who puts what data into the record.

Mr. Bangert. Well, how about reserve data, for instance, how does that come in to the record in a Federal Power case?

Mr. White. Well, reserves, I am sure, come in for a number of different reasons. One of them is to demonstrate how the prior cost may not be adequate because that gas was acquired at—the cost of finding it and producing it was, for example, at one particular level. But if those reserves are not proved adequate in order to meet the requirements of the interstate market, there will have to be additional gas discovered in order to meet that need. Therefore, the production of that gas will cost more money, in all likelihood, than the product cost earlier, simply because of inflation and because the easier and least expensive gas is found first.

So it becomes one of the integral elements. And I say "one" because I do not want to mislead you. There are a whole spectrum of them, and that is just one of them.

Mr. Bangert. Well, you alluded earlier to the Trade Commission's testimony yesterday, when they indicated that on the basis of the records that they had subpenaed so far—and I do not want to misquote them, but as I understand it, they believe that the AGA reserve reporting figures had been seriously underestimated.

Now, would those AGA figures be the figures that would be used in a rate case before the Power Commission?

Mr. White. I would say yes, that those would be the basic figures about which the controversy would swirl. As far as I am aware, in every cost item it elicited great conflict and controversy. Those, I think, would be the base or the starting point.

Mr. Bangert. Would part of the determination as to the rate to be set be based upon the quantity of reserves?

Mr. White. I do not believe it would be that direct, no. I think it would have some impact on the production cost. But conceptually, it is the cost of producing the gas in a cost-based pricing mechanism that is the critical thing, plus a reasonable rate of return.

So the proponents and the opponents would dispute over how much each particular element of the process actually did cost or could be predicted to cost.

So the reserves are important on some of those elements, but it is not an element in its own right.

Mr. Bangert. Would the amount of gas to be recovered, potentially to be recovered, would that bear on the cost?

Mr. White. Do you mean potentially to be recovered from wells already in existence or from those to be discovered in the future?

Mr. Bangert. In existence.

Mr. White. Well, I would say yes. Again, I would have to run back to that indirection. It is not a factor in its own right that has a dollar value or a fraction of a cent value on it.

Mr. Bangert. Well, are you satisfied with the method in which the Power Commission obtains this reserve information from the AGA?

Mr. White. No. As I have suggested, I believe the whole process of data collection is one of the prime needs—we ought to do something about it. It has been terrible.

I think that the industry's general attitude has been that this information has a confidentiality about it for business purposes, competition between various major integrated petroleum companies.

For all I know, there is something legitimate to that.

It strikes me, however, that even if it is legitimate, when you weigh it in the balance, it does not weigh very heavily when weighed against the need for the public to know.

For all I am aware, some of this information can be handled on a blind basis, where the confidentiality is protected, so long as we have reliable, aggregated information. And I think that the Government has a pretty good reputation for its capacity to handle sensitive and confidential data without too much difficulty.

So, fine, you are right, Mr. Industry, we ought to be very careful about the type of information we get. But I think we have got to have that information.

If it was important before, when there were not critical times and people were not complaining, now I think it becomes even that much more essential.

The industries have to make their own judgments—and they are not individual judgments in the sense they all agree, but for whatever it is worth, I think they are probably experiencing a great loss of confidence by the American public.

This is a period of time when all establishments and institutions seem to be shaking pretty drastically. My own sense is the petroleum industry is right with them.

If there was ever a time when they ought to be forthcoming, it seems to me it is now.

I do not know what there is to conceal, whether it is only business confidentiality; but certainly what Mr. Halversen testified to yesterday ought to whet the appetites of those who have been claiming that there has been a conspiracy.

I have never made that claim. I do not have enough data yet to do it. But certainly it is sufficient evidence when the Federal Trade Commission says that they want to go forward and complain about the reluctance they have had in getting data. It seems to me that it is appalling.

Mr. Bangert. Well, did you ever attempt to subpena this type of information when you were Chairman?

Mr. White. No. That was in a milder period, and I guess we did not think of it. I do not know. We did not, though.

There are an awful lot of other things that with the benefit of more time, staff and wisdom we might have done, but we did not.

Mr. Bangert. But the Power Commission does have subpena power, and I would assume it would be applicable to getting reserve data?

Mr. White. No, no, no. I misunderstood the question. You have got subpena power for those items that it can secure. But it does not have statutory authority to go out and get all the information that it needs. That is what we have been—when I say "we," I am talking about a whole trail of Commissions, 15 years—asking the Congress for.

It would require an amendment to the Natural Gas Act.

Mr. BANGERT. Would it require an amendment to subpena reserve data; is that correct?

Mr. WHITE. I am sorry, I cannot be quite specific on that. I think the answer is yes.

Mr. BANGERT. As you know, there are——

Mr. WHITE. Before we leave that, as I recall, there are forms where the data, that data is expected to be submitted. And, as a consequence, I have to believe, therefore, that that is within the data that can be obtained—with proper statutory authority, and it may well be that the answer is yes, it could have been subpenaed.

I am not sure, but I have enough confidence in the Power Commission, that if you ask them that question, that legal question, it will give a precise answer.

Mr. BANGERT. But there is clearly, as you indicate in your statement, other evidence that you feel the Power Commission needs that you cannot get at this time.

Mr. WHITE. Yes, absolutely.

Mr. BANGERT. When you were Chairman, what were the Power Commission's practices respecting returning documents and data to companies or destroying them?

Mr. WHITE. I do not recall that that problem ever presented itself. I am sure that some information may have been received on a confidential basis. As far as I know, it would still be in the files.

But I do not recall that we had a policy of returning them. But it is conceivable that that happened. If it arose I simply either was not apprised of it or no issue had been raised about it.

But I rather think that something as important as that would have come to the Commission's attention and since we did not destroy or return it, I believe, therefore, the material is probably still in the files.

There is, of course, some destruction of files simply because they accumulate and become old. But I do not think there was any conscious effort to take information and then destroy it once it had been composited or aggregated.

I simply cannot recall of a situation where that was presented to the Commission for a policy decision. I am relying, therefore, only on my recollection.

Mr. BANGERT. You, as chairman, never gave any orders or indication that material should be destroyed, I take it.

Mr. WHITE. No, I think not. I am not so certain that before Watergate that I would have been quite as conscious of the problem. I just do not remember the situation having presented itself.

It may well be that we did destroy some data, but it simply does not register in my personal recollection. But I rather doubt it.

Mr. BANGERT. Just one other area, and that is the optional pricing method.

Now, as I understand it, this method of rate determination is not cost based, is that correct, under optional pricing?

Mr. WHITE. Well, that is my understanding, too, although there is some language in the rule under which optional pricing proceeds which says that costs ought to be taken into account.

But it is not. It is primarily a "contract" approach which says whatever the parties have agreed to, if it is reasonable, will be regarded as the just and reasonable rate.

Mr. BANGERT. And this is, as I understand it, based upon the theory that there is a shortage and this is an incentive attempt to develop more case. Is that right?

Mr. WHITE. I assume that is correct, and I think, if I recall the rule, it suggests that that is the rationale for it.

I should make it clear, as my formal statement does, I think that is without statutory authority. I think the Commission does not have the authority to do that, and that, of course, is now being tested in the courts.

There is a case before the Court of Appeals for the District of Columbia Circuit.

But even if it were permitted, I just do not happen to think it would be a wise course to follow. All I can see it doing is increasing the price to consumers, drastically, without any assurance of corresponding benefits in the way of additional supplies or investment in securing additional supplies.

I just think it is a bad one from the beginning.

Mr. BANGERT. Does this, in fact, amount to de facto deregulation?

Mr. WHITE. Well, unless the courts reverse it, it could. I think it is really outrageous, in a sense. There is a need for more gas and to some extent I have compassion and sympathy for the present members of the Federal Power Commission. I told you how I sat there trying to figure out what a reasonable rate was.

It is not an easy job, and I know that these men must feel an enormous pressure to do something constructive. I think what they have decided to do and what is running through the President's message is—there is an easy solution. Let the price do it. The price will solve our problems.

I just do not think so. I think our problems are more difficult, more complex than that, and they are going to require different and more sophisticated approaches.

So if the FPC Commissioner is sitting there with that kind of an attitude—that what the country needs is to let the marketplace clear this problem up—then he will, I guess, grope for everything within reach, maybe even beyond reach, in an effort to get the darn prices up.

I have just never believed—and Mr. Canfield is a little more restrained in his presentation, but I gathered he, too, did not believe that price was our salvation.

Mr. BANGERT. If we had a truly competitive market—and this is the last question—in natural gas, would you as much defavor deregulation?

Mr. WHITE. I think there is nothing magic about it—regulating natural gas was not revealed to Moses on Mount Sinai, it was not on tablets of stone. It was a piece of legislation, and even then, there was a big conflict as to whether the Natural Gas Act applied to producer rates.

By a 5 to 4 decision of the U.S. Supreme Court, the answer was "Yes." So it was a close one. It could have been the other way.

I do not know how things would have gone. Nobody knows how they would have gone. But today we are in a situation where we have got to have regulation. I must admit, as one who was a participant in it, it is very difficult, very complex.

The Commission in the beginning of 1960 tried to do it on a company-by-company basis, and gave that up and went to an area rate basis. The area rates took an interminable amount of time. It was unconscionable and nobody who participated in the proceeding ought to feel good. They just ran too long.

But that does not mean that conceptually it should not be done. I think that the big work has been done.

I rather would see regulation than no regulation. I think at this moment in national history, it is essential. I think when we are going to not need regulation is when a number of things happen.

One of them is when there is liquefied natural gas or synthetic gas that is mobile.

The first question I bumped into when I went to the Commission was, some fellow said, "Why do you think there ought to be regulation of the prices of natural gas when there is none for coal and oil? They are all hydrocarbons used in the same way—you burn them and this creates energy. So why should three out of five fellows say what the rate ought to be for natural gas, and the marketplace sets the price for coal and oil?"

The answer given was the answer given to the Federal Power Commission; that is, that natural gas, by its physical properties, is different. Today we have millions of people who are at the end of distribution systems and pipelines.

I have a gas stove, a heating unit, and a water heating unit that depend upon natural gas, and I am there. I cannot say, "Well, look, maybe I will use some coal."

My local distribution company, the Washington Gas Light Co., has got to get natural gas in order to supply me. It cannot say, "I will get coal today," or "I will give you some oil today."

There may come a time when they will not have to buy natural gas from a pipeline. They will be able to buy synthetic gas because there are synthetic gas producers who have mobility.

It is the enormous investment of hundreds of millions of dollars in pipelines that made us believe that it made more sense to have regulation attempting to set the rates rather than competition, because competition simply was not as dependable and reliable in that particular commodity as compared to others.

Mr. BANGERT. Thank you very much, Mr. White.

Senator HART. Mr. Chumbris?

Mr. CHUMBRIS. Thank you.

Mr. White, the Senator has to vote in a few minutes, but there are quite a few things I would like to take up with you, some of which you have already answered.

I would like to get to one point, and I have used this previously—in a hearing on November the 13th and 14th, 1969, natural gas supplies was studies before Senator Moss' Subcommittee on Minerals, Materials, and Fuels.

There was a small producer by the name of Carey McGuire whose testimony begins around page 65 on through 73.

In it he pointed out, "Costs vary widely from one producer to another," and he goes on and he says, "In 10 years drilling slumped 32 percent, approximately 47,000 wells in 1958 to approximately 32,000 wells in 1968," a 10-year period.

"Some companies, fearing that we are in a hopeless quagmire of energy policy for the domestic exploration, have already been seeking foreign sources," and he is talking about 71, 68 cents liquefied natural gas.

Then he goes on to say that there are less rigs that are being drilled: "If there are 29 less rigs drilling, do not expect an increase in gas reserves," et cetera.

So he was complaining that for over a 10-year period, he was trying to get his gas increased from 13.3 to 16.6 cents per thousand cubic feet, and he could not get anything out of the Federal Power Commission.

Of course, each case is based on the record of each case?

Mr. White. Right.

Mr. Chumbris. But the way he put it, nobody was getting raises in those days anyway, from 1958 to 1968 which were the figures he used. Reflecting back, now, had those rates——

Senator Hart. In fairness both to Mr. Chumbris and the witness, let me, if there is no objection, leave. Continue and conclude your point, at which time we will recess because there are two votes to follow this, I am told. We will recess until 2 o'clock.

Mr. Chumbris. All right, thank you, Mr. Chairman.

Reflecting back, now, would the situation be different today if, during the sixties, an increase, let's say, from 13.3 to 16.6—if that had been—he points out, "If I had gotten that, I would have been in a better position to explore and discover new gas."

Would that have resolved the problem we are facing today?

Mr. White. Well, it is extraordinarily difficult to figure out what might have happened had something been different in the past.

I, of course, have no personal recollection of that individual situation or case. But there were emergency situations where the Commission permitted prices to go above the area rate, and of course, the area rate itself provides a mechanism for people to demonstrate to the Commission that this is the situation.

Part of the problem back then, when it was in effect a buyer's market, was that if there was enough gas being sold at 13.3, his being able to sell it at 16.3 would not have done much good anyhow. Why would people pay him 16.3 if they could buy it for 13.3? So even though the Commission did——

Mr. Chumbris. He was referring to his own situation.

Mr. White. Yes, but I am saying he has got to sell it to somebody, and if they can buy it for 13.3 from other suppliers and producers, he may have had a difficult time selling it.

I am only suggesting that the Commission, in 1960, embarked on an areawide basis, recognizing there would be some imperfections and perhaps even some inequities.

It said, for anybody who is unduly burdened by this, they have the option to come in and make their case.

As I just explained to you, I do not know how much help it was to the guy to be able to say that he could sell his gas for 3 cents higher, if the supply-demand balance was about even.

This was one of the problems of averaging, and I am sure there were some marginal producers who were either wiped out or went out of business and refused to go back into that business because it was not as lucrative as it might have been if the rates were higher.

But on the average—and that is what we are really talking about in assessing supply problems—take, for example, the *Permian Basin* case, and I have a hunch that is where that fellow was operating. The Commission came out with an area rate for Permian and, instead of production going off, it went up. People were drilling and investing and finding gas on the basis of the rate set by the Federal Power Commission.

Mr. Chumbris. He used this illustration as the impact that it would have on the consumer, because Senator Moss had commented, "Well, the consumer was saving 3.3 cents per thousand cubic feet."

He countered that with the point that the consumers of America are not really saving, because—because of the inability to get enough natural gas—they had to go to liquefied natural gas which, at that time I think they used the figure of 68 cents which today is $1.25.

He was using that as a point to show that it is a penny-wise but pound-foolish type of philosophy.

Mr. White. But as Mr. Canfield suggested and as I suggested, I think we have pretty well—well, I will not speak for him, but I will speak for myself—I am pretty well of the belief that 3 cents would not, at that particular point in time, have elicited any more natural gas.

I related the experience to you that I had when I was trying with the other members of the FPC to set the southern Louisiana area rate case.

Econometricians have tried their darndest to come up with a model which says, "If you increase the price of gas, the following things will happen," and then they say that there will be more exploration and more gas discovered.

Not a one of them is worth a darn. They have not withstood tests. So we just do not know.

Mr. McGuire may have been correct that had that price been 3 cents higher we would not find ourselves in the natural gas crisis situation today. But I have to tell you the truth—I do not think so.

Mr. Chumbris. Well, time is short. I think this would be a good place for us to stop.

There are thousands of questions we could ask you because of your expertise with the Federal Power Commission, but we appreciate very much your coming here today.

Mr. Nash. We will recess until 2 o'clock.

[Whereupon, the subcommittee recessed, to reconvene at 2 p.m. this same day.]

[The following was received for the record. Testimony resumes on p. 550.]

MATERIAL RELATING TO THE TESTIMONY OF LEE C. WHITE

Exhibit 1—Excerpt From Hearings Before Subcommittee on Minerals, Materials, and Fuels, November 13, 14, 1969

Mr. McGuire. It would only be human nature to feel that the job you were doing was appreciated by more people than it actually is. Similarly, it is human nature in the oil and gas business to overestimate your reserves. Just as you could modify your own sense of popularity with the results of an actual poll, I think the committee should dispel from its mind, and I think it has already done that from the testimony today, any thought about hidden reserves and instead be prepared for the possibility of overguess of popularity which in this business is equivalent to being overly optimistic about one's own reserves.

The price battles that the FPC fought in the name of consumer interest have been losing the war for new supplies. It has been said that in order for the industry to have a comfortable reserve in relation to its immediate demands, that the rate of annual reserves additions would have to be doubled immediately.

But how are we going to double the annual reserve addition if we are bogged down in paperwork? On a schedule attached to this testimony I have shown what is involved in a typical gas discovery for the independent producer. This is exhibit B at the end.

We discovered this field in 1953 and finally got our first check in 1956. In 1957, the FPC started putting in suspense the annual two-tenths of 1 cent per M c.f. escalation in price. Twelve years later and 10 different FPC dockets still haven't solved the problem.

Are we talking here about 68 cents per M c.f. like the cost of imported gas from Algeria? Most certainly not! What has been in suspense here all these years is the difference between 13.3 cents and 16.6 cents. Is this the way to encourage the producer to look for new domestic gas reserves?

One leading economist, Paul MacAvoy of MIT, castigates regulations for resulting in social benefits of 10 million but social costs of 100 million. The picture of regulations since the Supreme Court decision of 1964 requiring the FPC to regulate the producer has been one of harried regulators buried in paper.

The questionnaire mailed by the Commission in 1964 had the questionable honor of being the "largest Government form ever produced," and weighed some 10 pounds. The Commission initially tried to fix a return based on costs. But the amount of gas discoveries in return for a given expenditure is often no more predictable than the spin of a roulette wheel.

Costs vary widely from one producer to another. The policy was doomed from the beginning, and in 1960 was abandoned with over 2,000 unsettled cases. After that, an "area pricing" policy was adopted. After 8 years, only two area rate cases have been decided. One of the cases took 4 years of proceedings and 35,000 pages of transcript.

The result of this FPC quagmire is that today when the producer finds gas, the first thing you do is to make every effort to sell the gas to an intrastate market—that is, to a purchaser who agrees to use the gas within the same State in which it is produced—as opposed to selling it in interstate markets.

What kind of national policy do we have when the results encourage you to keep the gas in your own State and not move it across State lines to the East, where it is badly needed?

I would like to comment on the effects on domestic drilling.

In 10 years, drilling slumped 32 percent, from approximately 47,000 wells in 1958 to approximately 32,000 wells in 1968. Some companies, fearing that we are in a hopeless quagmire of energy policy for domestic exploration, have already been seeking foreign sources.

It has been said that liquified gas to be delivered from Algeria in 1971 will cost 68 cents per Mc.f., which is nearly twice the price for gas deliveries by pipelines in this country to New York.

A national policy which results in less exploration for domestic gas is going to end up costing the consumer huge amounts, the worse the shortage becomes. If something isn't done, we will be forced to rely on foreign shipment of gas and all the uncertainties that go with that. If the oil import program is changed, not only will we be dependent on the whims of the Arabs for oil, but we will also be dependent on them for liquefied gas.

While there is still some hope that the provision affecting the oil industry in the tax bill will be softened, the mere possible threat of tax erosion on the profits in this business has caused drilling to decline. For example, there were 29 less drilling rigs running in the United States on November 4 of this year than there were at the same time last year. Gentlemen, if there are 29 less rigs drilling, don't expect increases in gas reserves.

I would like to talk a little bit about the timelag necessary in this business.

Many people have the mistaken idea that we can turn our gas supplies off and on like a spigot, that when we have a serious gas shortage, all we have to do is quickly change some governmental policy and presto, we have new gas supplies.

People in the industry, of course, realize that this theory has no merit whatsoever. The facts of the matter are that, like having a baby, the timelag between the thought and the actual delivery of the baby is a long time. The time required between the first lease acquisition on a given gas prospect and the receipt of the first check for gas sales can be appalling.

Someone said that it is well before a committee such as this to have some specific illustrations. With that in mind, we have put on a schedule some statistics on the six gas discoveries that we have been involved in which resulted in new field designations.

I have some extra copies of this schedule if anyone would like to see it.

Senators, if you would like to turn to exhibit A, I think that explains my point.

This schedule shows the dates from the first lease acquisition, date of well completion, date of signed gas contract, date of FPC approval, date of completion of the pipeline, and finally, the date the first check was recieved.

This schedule shows that of our six gas discoveries, four currently have a market and two are shut in, waiting on a pipeline. As to the producing leases, the average length of time from the date of first lease acquisition to date of first check was 6.4 years. Gentlemen, 6.4 years is a long time.

As to our two shut-in-gas discoveries, which are in remote areas, the average time so far is 13.8 years, and still no pipeline connection or checks.

These figures prove, in our mind, that the timelag is tremendous in gas exploration, and, incidentally, these are not exceptional cases, since other industry figures clearly demonstrate this timelag. If we recognize that this timelag does exist and that you cannot turn this business on and off like a spigot, now is the time for creating a meaningful national policy before it is too late.

POSSIBLE SOLUTIONS

We have discussed here the crisis of supply, the question of reserve estimates, the resutls of FPC regulations, the end effect of all of this on domestic drilling, and finally, the timelag necessary in this business.

Are we going to do anything about it? Or is this merely going to be added to the millions of words already spoken on this subject?

We appreciate very much the committee calling this hearing and taking the time to listen to this testimony, and the following are a few suggestions as to the solution of these problems.

The only real solution, of course, is one that creates more incentive to explore for gas. As stated earlier, I would mention first what I would consider as an ideal incentive; second, alternative incentives if the first is not possible; and third, if Congress is going to do nothing, some suggested incentives the FPC could use under existing laws.

IDEAL INCENTIVES

1. What would be an ideal solution to the problem of the pending shortage of natural gas? My answer would be an overall coordinated national energy policy.

A coordinated national policy, of course, would not flood the country with imports or make unreasonable changes in the tax laws affecting the oil and gas industry if, in fact, the purpose of the national policy was to encourage incentives for exploration.

Finally, a study from a national policy point of view would have to conclude that Congress was right when it originally excluded the producer from regulations in the Natural Gas Act; that the FPC regulation of the utilities in the industry is sufficient and that the Supreme Court ruling requiring the FPC to also regulate the producer only resulted in chaos.

Such a policy would conclude that legislation was necessary to reverse the Supreme Court interpretation of the Natural Gas Act, and free the producer from regulation.

ALTERNATIVE INCENTIVE

2. The above would be what I consider an ideal solution. If, on the other hand, the climate is not yet right to return to a system where, under free competition, supply and demand for gas is determined in the marketplace instead of in 35,000 pages of testimony, then I would suggest the following alternative solution: namely, that Congress enact legislation which would compel the FPC to regulate natural gas as a commodity.

Exhibit 2.—Prepared Statement of Mr. White

PREPARED STATEMENT OF LEE C. WHITE, CHAIRMAN OF THE ENERGY POLICY TASK FORCE, CONSUMER FEDERATION OF AMERICA

My name is Lee C. White, and I am here today in my capacity as Chairman of the Energy Task Force of the Consumer Federation of America. Our Task Force currently has 15 member organizations (Appendix A), and our expressed purpose is to ensure that the consumers' views are expressed and considered in the energy policy debates currently taking place publicly and, in particular, within the Congress. We recognize that there is no necessary single "consumer interest" in any of the numerous issues that comprise the energy policy debates; nevertheless, we have undertaken to do the best job possible in assessing and stating the views of the consuming public and, as the broad base of our membership suggests, we do indirectly represent millions of Americans.

Quite obviously, consumers throughout the country have a very real interest in the energy shortages now being experienced. Our Task Force has attempted to focus on many of the problems and especially welcome the opportunity to appear before this Subcommittee which is exploring the natural gas facet of the energy crisis. Certainly this is an area deserving of study and legislative and administrative action.

I think one of the aspects of the current energy situation that is now becoming evident is the interdependence and interrelationships that are involved. There are, of course, the different fuels, tax policies, the role of government, the close relationship of environmental factors, international relationships, etc. Perhaps symptomatic is the large number of Congressional committees that have some jurisdictional interest and yet no single one of them has the responsibility, insofar as the public is concerned, for the fact that the problems are still largely unresolved. Our group supports a centralization of energy functions within the Executive Branch and, it seems to me, a corresponding consolidation of basic energy functions and jurisdiction into existing Senate and House committees—or perhaps new committees or a joint committee—is equally desirable and, indeed, essential in the legislative branch.

The natural gas part of the mosaic is an important one, and I will try to spend some time on what I regard as the principal factors that have led to an imbalance between supply and demand for natural gas and some of the steps I believe could be taken to help the situation. Additionally, I would like to discuss in a general sense the suggestion made by the President and others that natural gas be decontrolled at the producer level.

HISTORICAL BACKGROUND

It may be helpful to an understanding of the situation to spend a little time on a brief background of the natural gas industry in this country. Although manufactured gas was used in a number of cities in the early twentieth century, it was not until the late 20's and 30's that considerable quantities of natural gas were discovered in connection with the discovery of oil in major oil producing areas, particularly in the southwest. At that time, gas was a disagreeable byproduct that was burned off—or flared—simply to get rid of it as part of the process of extracting oil from the ground. Its use as a fuel, however, soon became sufficiently important for it to be piped into areas where it could be used. During the 1930's, the Congress recognized that the spread of pipeline networks across the United States made it necessary to protect the consumers of natural gas against their becoming captives of the industry in light of the enormous investments in pipelines and in the equipment purchased by consumers to use gas for space heating, water heating and cooking, as well as for commercial and industrial purposes. Thus, in 1938, the Natural Gas Act was enacted, with the administration of the Act being assigned to the Federal Power Commission which was then administering the Federal Power Act.

The initial determination of the FPC was that the Act did not give it jurisdiction over the prices at which gas was sold at the wellhead into interstate commerce. The U.S. Supreme Court, in the landmark *Phillips* case in 1954, brought by the Public Service Commission of the State of Wisconsin, held that the Natural Gas Act did cover such sales. From that time until August 1960, the FPC undertook to establish wellhead rates on a company-by-company basis. In August 1960, it concluded that the traditional or classic form of public utility regulation was simply not workable insofar as wellhead prices were concerned and embarked on an area rate basis. By this process, the Commission undertook to divide the producing areas of the nation into separate major areas and to establish rates for each of those areas on the basis of the average costs of producing gas in the area plus a reasonable return. This approach was ultimately confirmed as appropriate and legal by the Supreme Court in 1968.

In late 1968 and early 1969, it became apparent that an imbalance between supply and demand was developing, not in the sense that there was no gas left or that reserves could not supply existing loads, but in the sense that the proven gas reserves being added annually were less than the volumes of gas being consumed nationally. We were using more than we were finding.

Most industry officials and many observers blame the shortage on "artificially low" prices set by the FPC during the 1960's. What is "artificially" and what is "genuinely" low is, of course, an extraordinarily difficult question. The statutory assignment to the FPC is to set "just and reasonable rates" which has been interpreted to mean those rates that are the lowest possible which will provide the necessary incentive for adequate supplies of gas to be produced. I believe the simple statement of the requirement is sufficient to indicate its inherent difficulty of implementation. In any event, even if one accepts the premise that higher rates would have produced more gas, I believe that is not very helpful and, indeed, there are numerous other factors that have contributed to the current situation in which there is a gas shortage. Briefly, I would like simply to list a number of those that I think are among the most important, recognizing the virtual impossibility of assigning a qualitative weight to any one or any group of these factors.

Inadequate industry data.—For over 15 years, different memberships on the FPC have unanimously and continuously sought statutory authority to permit it to acquire greater information and data on reserves, costs and other aspects of the natural gas industry. These efforts have thus far been in vain, although there is reason to be somewhat optimistic that Congress may now enact such legislation. Additionally, the producing segment of the industry, at least until 1970, refused to submit any data on intrastate operations. One factor contributing to the long drawn out area rate proceedings was the difficulty of securing from the industry adequate information upon which to determine the cost of producing gas. According to those better schooled in accounting principles than I, the accounting practices used by the producers left a great deal to be desired.

The National Gas Survey.—The FPC, recognizing the need for a study and survey of gas reserves, demand and other important factors relating to the nation's natural gas industry, requested Congressional approval and funds for a National Gas Survey starting in 1966. Each year for 4 or 5 years, the Congress expressly disapproved the idea and provided that no FPC funds could be used for that purpose. The survey is now underway, and although there has been some controversy about the composition of the advisory committees working on it, at least work is proceeding. It is, of course, late, but we cannot turn the clock back.

The role of the pipeline industry.—As the middle man in the operation, the pipelines held themselves aloof from the area rate cases in the 1960's refusing to antagonize their suppliers on the one hand and customers on the other. Perhaps their situation is understandable, but their criticism of the regulatory process and in the results of that process came mighty late. During the era of plentiful gas, their concern was to keep their pipelines full, not necessarily the spreading out or the most efficient use of what is a finite and, therefore, limited resource.

The role of distribution companies.—The natural tension that exists between buyer and seller led the distributors generally to seek the lowest price, and today we find them in the somewhat awkward position of urging that the sellers be permitted to raise rates, or, indeed, to have no regulatory control of those rates at all.

Offshore leasing policies.—A great deal has already been said about the fact that the Federal Government established—and continues to employ—its oil and gas leasing policies in connection with federal offshore areas on national budgetary considerations, rather than on the basis of wise and efficient use of a natural resource.

The decline in oil discoveries.—To those who ascribe the gas shortage either to the fact that gas rates are regulated or that they were set too low, the question must be asked, "How do you explain the fact that exploration for oil and discoveries of new oil reserves also declined during that period without any Federal or state control over the price of oil?"

The failure to anticipate the dramatic increase in consumption.—In my view, the FPC, as well as all segments of the industry, were at fault in not anticipating the fact that an industry, which had been increasing in consumption at the rate of about 4% or 5% annually, jumped in 1968 to nearly a 9% increase over the preceding year and these higher levels of increase persisted until this past year. One will never know whether a national gas survey undertaken on a timely basis might have enabled this type of forecast to have been made, but it must be evident that this sharp increase in demand was one of the critical factors contributing to today's shortage.

Settlement proposals offered by the industry.—Recognizing the long time delays involved in the area rate proceedings, elements of the industry entered into settlement discussions with the thought that they could offer the FPC agreed upon rates which, if adopted by the Commission, could save a great deal of time and expensive litigation. Because of the nature of the industry, with numerous producers in any single area and numerous customers at the end of the pipeline networks, 100% agreement was regarded as an almost impossible goal. Nevertheless, 85% of the producers in Southern Louisiana, measured by the volume of gas produced and roughly 85% of the distribution companies again by volume, agreed upon a proposed rate schedule and offered it to the FPC in 1968. The FPC did not accept the precise schedule offered, but in the view of most observers, came somewhat close to the agreed schedule. Rates set by FPC were lower, but not by much. Subsequently, in the same proceeding, the industry reached substantial agreement on a much higher rate schedule, increasing the rates by more than 30%; since these rates were agreed to by the producers, the assumption followed that they would provide adequate incentive for producers to explore for gas in the Southern Louisiana area. If, then, the only factor was rates, it is difficult to understand why there would not be increased drilling and new gas discoveries. Perhaps the producers, in their own requests, had not asked for "enough" during the 1960's.

Alternative investment opportunities.—Of great significance, in my view, has been the fact that so long as there are attractive alternative investments that petroleum companies can make, either in petroleum efforts around the world, or in nonpetroleum fields (for example, the acquisition of coal companies, uranium companies and nonenergy business opportunities), there is no heavy pressure on them to invest in natural gas drilling, especially at a time when rates are rising.

Certainly one cannot contend that the area-rate proceedings have been models of administrative practice or that their results were necessarily "right", but I trust that the listed factors will indicate the complex character of the problem that faces this Committee and the nation as efforts are made to remedy the gas supply situation.

THE FEDERAL REGULATORY SCHEME

The Natural Gas Act requires the FPC to regulate wellhead prices for gas moving into interstate commerce, rates pipelines charge for transpotration service, and rates at which they sell gas to local distribution companies. State regulatory bodies fix the rates at which gas is sold to the ultimate consumer.

Although the characteristics of monopoly which gave rise to the Natural Gas Act, in my view, still justify regulation, the regulatory process does not follow the classic regulatory scheme insofar as it relates to the producing segment of the industry. The basic difference is that the FPC must fix the rates at which producers sell gas, but there is no obligation on the part of the producers—or authority on the part of the FPC to compel them—to drill a single well, produce a single cubic foot of gas, of, if the producers have gas, to sell it to the interstate market. By contrast, an electric utility which is given a franchise in a geographical area undertakes to provide service in return for that franchise, and regulatory bodies have the authority, within liimts, to compel the necessary investment to provide that service.

One can readily sympathize, therefore, with the FPC which, under the existing framework, can only try as best it knows how to induce the petroleum industry (and for the most part, we are talking about a relative handful of major companies that produce the great bulk of the nation's natural gas) to make the necessary investments.

Econometricians have struggled to produce econometric models of the natural gas industry so that they can tell the regulators how much additional gas will be producted if they, the regulators, increase the price of gas 1 cent, 2 cents, 3 cents, 25 cents, 40 cents, 75 cents. So far, this has proven to be a fruitless and frustrating effort.

In focusing on policy changes that ought to be considered, including both legislative and regulatory, it may be useful to refer to the overwhelming disbalance now existing between buyers and sellers. Until the late 1960's, the distribution companies, or the buyers, were in a favorable position, but now that the situation has shifted, pipelines and distribution companies are almost imploring the producers to sell them gas. It is understandable that anyone in the gas distribution business today would believe there is no alternative to accepting the producers' viewpoint and to agree to almost any inducement to get them to make the necessary investments and then sell the gas to the interstate market so the distributors can meet existing and future demands. This is obviously not a very comfortable background, but though somewhat oversimplified and overstated, in my view, it is about the way it appears to be.

Another factor to bear in mind in evaluating the existing situation and proposed solutions is the finite character of our nation's gas supply. Thus, we must focus on how strenuous our effort should be to discover and use our own gas reserves in light of our sharply increased attention to alternatives, namely, the manufacture of the equivalent of natural gas from coal and the importation of liquefied natural gas from North Africa, Venezuela and elsewhere. Additionally, there must be folded into the analysis the possibilities of increasing Canadian gas imports, both short term and perhaps longer term. Similarly, the major role that nuclear energy will play 25 years from now enters into the assessment.

Setting out these questions does not, of course, answer them. But they are pertinent and provide the background for considering possible approaches to the gas shortage problem.

RECENT FPC POLICIES AND DECISIONS

The FPC has a tough job in trying to establish "just and reasonable" rates which have been held to be those that are necessary to produce the required supply of gas at the lowest possible rates. Basically, it seems to me, the Commission has, in recent years, been embarked on a course of raising rates that producers may receive for their gas in every way they could. As a representative of a group of consumer-oriented organizations, I have no built-in problem with consumers having to pay a higher price for gas. What is disturbing is a set of policies that would put the millions of gas consumers who have already made their investment in equipment and facilities and are, therefore, captives in an untenable position where there is no alternative to paying "what the market will bear." I think it is generally accepted among observers of the industry that it is an oligopoly, and that it does not function on a competitive basis. It may well be that sometime in the future it will be competitive, but today the producing end of the industry is dominated by a relative handful of major producers and consequently the captive consumers at the end of the interstate pipelines and the associated distribution systems need protection.

Recent FPC decisions suggest that it is embarked on a course of attempting *de facto* deregulation without the benefit of Congressional action. Perhaps the frustrations of a shortage situation compel members of that agency to seek to short-circut the legislative processes, but, in my judgment, this is an inappropriate way to proceed. Especially outrageous, in my view, is the Rule adopted by the FPC which provides a so-called "optional procedure" for fixing prices for which natural gas can be sold by producers at the wellhead.

Basically, the "optional procedure" provides that whatever price for gas is arrived at between the producer and the purchaser (primarily pipeline companies) will be considered by the FPC and presumably adopted. The only possible interpretation of the Rule is that it is an attempt by the Commission to ignore the Congress and, in effect, to accomplish deregulation with respect to new gas by administrative fiat. The effort is probably illegal in the sense that there is no apparent statutory basis for the Rule; the authority is being challenged, in the Courts, one of the plaintiffs being a group of 21 Congressmen. It is, on the basis of past experience, not likely to produce the intended results. And, most surprisingly, the Rule was adopted when the Congressional committees with jurisdiction over the Natural Gas Act and the energy situation generally were engaged in serious reviews of these very issues and considering legislative changes.

The most distressing aspect of the Rule is that it provides no assurance that additional gas will be made available for the consumers of the country; it only assures that they will pay greatly increased prices for gas. During the past few years, as a result of FPC decisions, total gas prices have increased markedly, and during that time decreasing reserves have been discovered, and a decreasing percentage of gas has been made available to the interstate market.

According to FPC figures, the price paid at the wellhead for gas in interstate commerce (approximately three quarters of all gas produced) has increased from 17.75 cents per 1,000 cubic feet in 1969 to nearly 22 cents in April 1973, the latest figures available. Even more meaningful to users of natural gas in consuming areas is the increase in the prices received by pipelines from local distribution companies. In three years, the average price has increased from 36 cents to 46 cents per 1,000 cubic feet, an increase of 28%. The recent decision of the FPC approving a 45 cent per mcf (1,000 cubic feet) price for gas in South Louisiana represents a 73% increase over the area rate of 26 cents agreed to by the producers and distributors and set by the FPC less than 2 years ago.

Although in terms of pennies, these increases do not seem meaningful, they take on a totally different character when applied to the tremendous volumes of gas that are involved. For example, the total U.S. consumption in 1972 was approximately 22 trillion cubic feet. Assuming that the same price factors applied (and it is a very fair assumption) to intrastate gas which is a part of that 22 trillion total, the American consumer will pay over $200 million annually for each penny of increase. Thus, applying the 10 cents increase for the pipeline sales (and limiting it to interstate gas) for 13 trillion cubic feet, American consumers paid nearly $1.3 billion more for gas in 1972 than in 1969. If the figure relates to the total volume of gas including intrastate, we are talking about more than $2 billion. Despite this greater price paid by consumers, the volumes of gas discovered have continued to decline.

There are vast discovered (and undiscovered) reserves not yet dedicated to the interstate market and until they are, the price is open. Thus, any increase in rates automatically increases the value of those reserves. If we take 1,000 trillion cubic feet as a base figure, a very low and conservative base, a one cent increase per 1,000 cubic feet lifts the value of those reserves by $10 billion.

It seems to me that as willing as consumers should be to pay more for their energy, they should not be expected to pay more than the cost of producing it plus a reasonable rate of return on the investment where there is a noncompetitive or oligopolistic situation. Thus, I believe that it would be a major mistake to eliminate controls on the price of gas paid to producers at this time. When the liquefied natural gas and the synthetic process have developed to the point that there is adequate mobility, and distribution systems will not be at the mercy of their suppliers but will have real options, I think then there will be no need for regulation.

It would be anomalous, at the least, for Congress to decontrol natural gas rates at a time when inflation has obviously gotten out of hand in this country and when a price freeze is on and price and wage controls of some continuing character are being contemplated. To take an item as essential to this nation as natural gas and put it at the mercy of the market place when we are fixing the price of food, clothing and other items, simply makes no sense at all.

With the type of situation that exists today, it makes sense, therefore, to focus on the uses of natural gas. This is obviously a jungle that no self-respecting regulator would want to get into, and yet I believe it is the responsibility of government to perform those tasks that are disagreeable, complex, difficult, controversial and maybe even impossible to do well. The FPC has, to some extent, entered into this thicket, and I believe it is appropriate and desirable that it do so.

SUGGESTED LEGISLATIVE AND REGULATORY POLICY APPROACHES

The following are a number of specific suggestions that, in my view, merit the attention of the Congress. Some could be accomplished with relatively little dislocation; others are certainly far-reaching and even controversial in character.

1. The Creation of a National Energy Resources Corporation.—Although there are some exceptions, basically our energy resources industry in this country, and this is particularly true of natural gas, is in private ownership, with government, both Federal and state, playing some regulatory roles. A number of gas distribution systems are municipally owned and operated, but most production of gas is performed by privately owned corporations. There is, of course, nothing inherently wrong with the system, and it has served this nation quite well, particularly if the basis for judging its success is our standard of living and the degree of industrialization of our nation. Where the profit incentive proves to be inadequate, either on a continuing basis or an intermittent crisis basis, consideration should be given to alternatives that do rest solely on the profit motive. I do not believe it would be in the best interest of the nation to recommend nationalizing the petroleum industry or the natural gas segment of the industry. I do not believe it would be in the overall public interest to grant to governmental agencies the authority to require private investors to make the necessary investment to explore for and develop oil and gas reserves in this country. I do think, however, the time has come to consider arrangements whereby the oil and gas deposits owned by the American public, through its ownership of public lands, including the Federal portion of the Outer Continental Shelf, can be discovered and made available to meet national needs in times of crisis.

I am unaware of any petroleum company executive who has stated that the need for natural gas to meet increasing demands is so great that his company is willing to invest X percent of its annual exploration budget or a specified dollar limit to ensure that the requisite volumes of gas will be discovered. And I can understand why this is the case. It would be very difficult for one who must report to his stockholders and where profit is the basic, if not the sole, criteria in evaluating investment alternatives. But I don't believe this is good enough for a nation dependent upon energy and which today has a gas shortage and which sees no immediate relief in sight.

The experience of the electric utility industry demonstrates that there is no single ownership form required to meet our national electric energy requirements. In fact, there are those who believe that the competition among privately-owned utilities, those that are Federally owned (TVA and the Bonneville Power Administration), the 1,000 cooperatively owned rural electric utilities, and the nearly 3,000 municipally-owned utilities, has been beneficial for all elements of that pluralistic industry.

A government-owned corporation to explore for and develop petroleum resources on publicly-owned lands could serve to supplement the privately-owned segment of the petroleum industry and, although it should manage the nation's resources in an efficient manner and on a profit-making basis, it would also be expected to be strongly motivated by the need to meet national energy requirements. One of the recurring problems faced by the FPC and the government generally has been the reluctance of the natural gas industry to make available data relating to their gas operations. This has made even more difficult the FPC's job of establishing area rates, and although I continue to believe the Congress should enact legislation (sponsored by the FPC for at least 12 years and through 4 different Administrations), the existence of a National Energy Resources Corporation operating in these areas would be extremely useful in supplying information and data on actual costs and operations in a field that has proved to be most difficult to regulate. This nation has been willing to use its wealth and its resources in a proprietary manner when convinced that such an approach was the best solution to a national problem—stockpiling of strategic goods, development and ownership of nuclear devices, and operation of the Alaska railroad, to name a very few.

2. Acquisition of Independent Geological Data by Governmental Agencies.—Disputes over geological data and over the sources of those data are bound to continue and to plague government policy-makers until there is an independent source of information. Governmental agencies should, if it is necessary, be given legislative authorization and adequate funding to enable them to conduct independent test drilling to provide a body of data essential to evaluation of various aspects of the natural gas supply situation. Whether their efforts should be on a total basis or a spot-check basis, or some combination, is not as important as the fact that this effort should be undertaken and with taxpayer funds financing the effort.

The National Gas Survey, currently being undertaken by the FPC—a proposal which I supported while at the Commission—is apparently already suffering from lack of public acceptance because of criticisms leveled at the membership of the Advisory Committees and some of the ground rules. I do not know whether these criticisms are valid, but this matter of credibility with the public is vital. Congress should take steps necessary to assure the public that these issue are being investigated comprehensively and fairly.

3. *Modification of the Federal Tax Structure to Discourage American Petroleum Investment in Foreign Countries.*—Federal tax policies have encouraged American petroleum companies to invest vast sums of money in exploring for oil and gas in areas outside of the United States. Obviously, there are some national interests that are served by such efforts, and yet when one examines our need today for investment funds in the United States to discover and develop petroleum deposits, it seems evident that our tax policies should be modified to reduce incentives for overseas investments and correspondingly to make investments in this country more attractive. As noted above, I do not believe the Congress should compel privately-owned companies to take any particular course of action. However, Congress, as the policy-making mechanism in our society, should adapt and modify the rules to achieve national objectives. If, therefore, there is a desire and a need to stimulate greater investment in this country, it is appropriate, if not essential, to "tilt" the tax factors in a fashion that will achieve that objective.

4. *Encouragement of Individual Field Pricing Outside of the Area Rate System.*—The area rate concept of regulating gas moving in interstate commerce at the wellhead was substituted for the traditional utility approach initially undertaken by the FPC following the Supreme Court *Phillips* decision in 1954 which was found to be unworkable. Fundamental to the area rate is the principle that averaging the costs will provide a rate that will be generally satisfactory to all operating within that area. Perfectly consistent with that approach is the option available to individual producers to demonstrate that the area rate is not satisfactory and, thereby to seek a rate keyed to the particular circumstances of the applicant. I do not know that legislative action is required to permit this concept to operate, but when there are purchasers willing and able to pay higher rates simply to be able to meet their own supply problems as is the case today, it is consistent with the regulatory scheme and, indeed, with the balancing of consumer and investor interests to permit special rates, provided that the gas producer is willing to make available to the FPC *all* pertinent data about the particular field. Although I have not attempted to confirm the facts, I am advised that some recent discoveries of highly prolific gas wells were so costly because of the deep drilling involved that simple arthimetic will disclose that at the prevailing area rate for that particular basin, the investors cannot even recover their actual costs. If that is correct, there should be some opportunity for those willing to make all of their data available and to permit complete scrutiny to sell their product at a rate which will return them a fair and reasonable profit.

5. *Modification of Policies Governing Offshore Leasing.*—Here, too, the suggestion has been made in numerous ways and on numerous occasions that a shift to a "royalty" basis should stimulate the interest of investors in discovering deposits in the Outer Continental Shelf. Additionally, there should be tougher requirements on production schedules. I do not necessarily accept the thesis that the gas shortage is artificial or that it is the result of actions by leaseholders sitting on gas reserves that have already been discovered and proved. Nevertheless, policies which require early production should have a beneficial impact on the short range gas supply problem.

6. *Impact of State Conservation Practices.*—Conservation practices implemented by gas-producing states have a considerable impact on the supply picture. If natural gas is a premium fuel, currently in short supply, and if this shortage has an adverse impact on national well-being and industrial development, the Federal Government should control this activity insofar as it relates to natural gas to ensure that there are no state policies operating to diminish the flow of gas for any improper purpose. Sound conservation practices are, of course, to be encouraged. But when state interests, particularly in the case of tax revenues and other interests, such as state-received royalties, are permitted to influence state agency decisions on the volume of gas that can flow, there is an obvious conflict with the national interest. Such action which is undesirable at any time becomes intolerable in times of gas shortage.

7. *Distinction Between Interstate and Intrastate Gas.*—In 1938, one could understand why the Congress would distinguish between gas moving in interstate commerce and gas produced and consumed within a single state. Today that distinction has created a situation which serves to exacerbate the gas supply prob-

lem. Both interstate and intrastate gas should, in my view, be treated alike. Neither category should be subject to Federal regulation, or both should. I recognize and sympathize with the view of the gas-producing states that they should have the benefit of a natural resource that fortuitously is located within their boundaries. And they should have the natural advantage of very cheap transportation costs to move the gas from where it is to where it is to be consumed. I do not believe a premium fuel should be priced in such a fashion as to be available for the most inferior uses within the state where natural phenomena happened to place it. Rules that were tolerable and even practical at one point in time should not be continued when circumstances are so altered that the same rules subsequently result in policies and practices contrary to the broad public interest. I believe that the distinction between interstate and intrastate gas meets that description and the distinction between them should no longer exist.

8. *End-Use Controls.*—As implied in the point regarding the distinction between interstate and intrastate gas, I believe we have come to that point in time in the development of the natural gas industry where there must be distinctions made on the purposes for which gas is to be used. Undeniably, it will be one of the most difficult, complex and controversial assignments that could be handed to any regulatory body, and yet I believe the Congress must impose that responsibility on some regulatory authority if we are to use more wisely and effectively the finite amount of gas which is available to us in this country. In a free market economy, pricing techniques develop priorities. Other techniques of allocation are required, however, where, as in the natural gas industry, monopolistic characteristics require some form of regulation to supplant, in a most imperfect fashion, the dynamics, restraints and forces normally supplied by competition. The use of gas for residential purposes—space heating, water heating, cooking—must have priority. And yet, when gas shortages result in industrial stoppages, there can be severe economic disruption and dislocation. Thus, we have to create priorities and arrangements which will make it possible for alternative fuels to be used. It is apparent that larger and industrial users will be better able to use alternative fuels and in a way that will be acceptable environmentally. The magnitude of the assignment is obvious, and one must sympathize with any agency assigned the burden of implementing such policies. But, frankly, I think we have no acceptable alternative.

9. *Liquefied Natural Gas, Synthetic Natural Gas and Marginal Pricing.*—The Committee will hear a great deal about the extraordinarily difficult problem of natural gas selling for 25 cents per 1,000 cubic feet at the wellhead, at about 50 cents per 1,000 cubic feet to the distribution company on the east and west coasts, and the $1.25 price for 1,000 cubic feet of liquefied natural gas, and perhaps $1.50 for 1,000 cubic feet of synthetic natural gas. Because the gas industry operates on the "rolled in" basis, it will be claimed that relatively small percentages of the very highly priced LNG and SNG will have very little initial impact on rates paid by the ultimate consumer. It is in this area where the concept of distinguishing among the uses to which gas will be put will be a most significant consideration. Residential consumers, especially those that are already using gas, are not able to convert to other fuels on a very convenient or economical basis. Accordingly, the Congress should consider a policy which would place the primary burden of the higher costs of liquefied and synthetic gas on industrial users which, by the nature of their activities, are better able to adapt to alternative fuels. To the extent that this takes place, there will be a greater burden on them which will inevitably be passed on in the form of higher costs for products and services they provide. Nevertheless, this is more likely to be the least undesirable handling of what we must be prepared to accept in our nation; namely, increased costs for energy. The marginal price at which gas will be abandoned for alternative fuels will obviously be reached more readily by industrial users, and thus the burden of the higher priced natural gas products ought to be weighed toward them.

SOME ADDITIONAL OBSERVATIONS

1. *Is the energy shortage, and particularly the natural gas shortage, the result of a conspiracy.*—Increasingly the question is raised as to whether the shortages of fuel, and particularly that of natural gas, are the results of a conspiracy, either direct or indirect, on the part of industry to create the shortage and thereby achieve some commercial benefits: the demise of independent producers, the elimination or diminution of federal regulation and a desire to exploit a

noncompetitive market and thereby earn higher profits. This Subcommittee and the Federal Trade Commission, as well as the Justice Department, are inquiring into this issue. Additionally, the House Select Committee on Small Business explored this question in 1971. So far as I am aware, there have been no facts yet obtained that indicate that there is an industry-wide conspiracy of the type that would warrant prosecution under the antitrust laws, although the recent action filed against Texaco and Coastal States may produce some useful data. The most unfortunate aspect of this entire question of conspiracy has been the continuing inability of government to secure from the industry adequate data upon which to assess the market structure and to offer a determination to the Congress and to the public. Despite this absence of adequate, extensive and reliable data, it is not surprising that companies will respond in a parallel or identical fashion to the same stimuli. After all, one of the fundamental characteristics of the private enterprise system is to maximize profits, and it is hardly unusual, therefore, that companies would adopt tactics and act in a way to achieve that objective. As indicated above, I believe one of the important needs is to make less attractive the incentives for alternative operations by the industry in overseas situations. It is even more essential during times of shortage that there be public confidence in the industry and in the role played by government. I do not believe that business confidentiality which the industry offers in support of its unwillingness to provide information weighs sufficiently heavily to deny the necessary data to government and to the public.

2. *Is the industry noncompetitive.*—Certainly insofar as the production of natural gas is concerned, there are a large number of producing companies, but the concentration in the industry of the integrated petroleum companies is overwhelming. Moreover, I have not been aware of any situation in which a producer obtained a sale by selling at a lower price than his "competitors." The basic area rate decisions adopted by the FPC and affirmed by the courts rests on the assumption that the market is grossly imperfect and that reliance, therefore, on contract prices (those agreed to by the buyer and the seller) simply are not acceptable as free market operations. In part, this is because of the heavy concentration of gas production in a few major companies; and in part, because the purchasers, the interstate pipelines, have producing affiliates and are permitted to pass on to their buyers the full cost of the product that they purchase, or put differently, there is no real incentive on the part of the pipelines to bargain vigorously on a price basis. Perhaps one of the most persuasive documents offered in the recent "optional pricing" case before the FPC by the FPC staff economists demonstrating in great detail the interlocking relationships among the major companies and some smaller producers in joint bidding for offshore federal leases, in bidding for Louisiana State leases, in their joint production from offshore tracts, in joint ownership of foreign subsidies, in joint ownership of oil pipelines and in unitization agreements. One of the most important contributions that a United States Government-owned fuels corporation could perform would be to provide a prod and perhaps a "yardstick" for the industry; it would not require a very large production or operation of any large proportion of total production to make its competitive impact felt.

3. *Waiting for the second shoe to drop.*—If the FPC has recently made any contribution to the shortage, it is by way of holding out the promise to industry that if they will simply hold off, decontrol will come, either through Congressional action or through indirect activities by the FPC itself. This has the obvious effect of inducing delay. Hardly a single one of us would be enthusiastic about making commitments of enormous amounts of money for exploration and development at a time when we believed that the golden period was at hand. It seems to me, therefore, that Congress should act affirmatively, one way or the other. It should decontrol producer rates (a position that our Task Force opposes), or it should tell the industry what the rules will be for the time being. I do not think that the decision not to deregulate should be made by default, but rather by conscious and affirmative action—in fairness to the industry, to consumers and to the public at large. The idea of a moratorium on gas rate increases lasting until the end of this year, proposed by Senator Moss and Chairman Staggers of the House Committee on Interstate and Foreign Commerce, should be adopted, provided that such action constitutes at least an informal commitment on the part of Congress to face up to the natural gas issues and to reach some definitive position on these issues. As I noted earlier, one of the difficult problems has been the inability to saddle any committee with responsibility, but the situation is sufficiently critical that action must be taken this year by Congress.

4. Should we let the market place allocate natural gas.—To those who believe we are consuming too much natural gas and that the market place should serve as the allocator by forcing those who can use alternative fuels to do so by the simple device of letting the price go where it will go, my response is that such an action taken today, aside from being disruptive in a period of steep and widespread inflation and when there is a shortage of supply, is not the most efficient and desirable allocation process. It seems to me that a national policy ought to preclude the use of natural gas for some "inferior" uses regardless of the ability of the users to outbid the residential consumers of the country.

CONCLUSION

These hearings on the nature of the natural gas industry, on the responses of the FPC to the difficult problems facing it and on possible solutions are appropriate and hopefully will be constructive. I must note, however, that almost every day's Congressional Digest reports that one or two hearings on the energy situation have been conducted. I do not, however, detect that any basic legislative approaches to the natural gas aspect are beginning to gather sufficient steam for us to be hopeful that meaningful legislation will be on the President's desk prior to the adjournment of this session of Congress. We have studies, hearings, statements, positions, including a Presidential Message, and I think that, if I may say so respectfully, the time is overdue for serious legislating with regard to natural gas. Whatever this Subcommittee can do to stimulate action will, I am sure, be appreciated by the consumers of America.

APPENDIX A

Membership of Energy Policy Task Force

American Public Gas Association
American Public Power Association
Consumers Education and Protective Association International
Consumers Union
Cooperative League of the United States
Industrial Union Department of AFL–CIO
National Farmers Organization
National Farmers Union
National League of Cities
National Rural Electric Cooperative Association
New Populist Action
Oil, Chemical & Atomic Workers International Union
Tennessee Valley Public Power Association
United Auto Workers
United States Conference of Mayors

AFTERNOON SESSION

Senator Hart. The committee will be in order.

This afternoon we welcome Mr. Charles H. Frazier, who comes to us with a background that is rich and full, and I am sure that the readers of this record as well as the subcommittee will be the better for hearing from him.

STATEMENT OF CHARLES H. FRAZIER, INDEPENDENT PUBLIC UTILITY CONSULTANT

Mr. Frazier. Senator Hart, I appreciate the opportunity of appearing here, but even more I appreciate the challenge of having to put down on paper some distillation of thoughts on this very complex and interrelated problem.

We tend to react to different phases of it and different questions, and the problem of putting together an answer that makes sense from all directions, or attempts to make sense, is an extremely difficult one.

You understand, Senator Hart, that I am not appearing here for the Associated Gas Distributors or for the National Economic Research Associates, but rather as an individual consultant. I would appreciate it if my statement could be incorporated in the record.

Senator HART. The statement will be printed in full.

Mr. FRAZIER. And I will attempt now to highlight some of the features of it.

Senator HART. That's even tougher than putting it down.

Mr. FRAZIER. Well, I realize that, and when you summarize it you end up by perhaps overrunning your time, but I have put my watch in front of me.

Senator HART. No, I was not suggesting that you do that.

[Mr. Frazier's prepared statement appears at the end of his oral testimony.]

Mr. FRAZIER. Your problem as a subcommittee of the Judiciary Committee on antitrust problems relates essentially to the problem of competition within this rather complex industry. In addressing myself to that, I wanted to make the point that there is no such an entity as the "oil and gas industry," which has been referred to by several witnesses earlier in the hearing.

Nor is there, indeed, a gas industry, as spoken of as having three sectors: The distributors, the pipelines, and the producers.

The producers essentially are members or participants in the oil industry, which is a competitor of the gas industry as I know it; the entity is made up of the distributors and the pipelines, in the ultimate marketplace.

And to call it one industry implies essentially that there is some antitrust activity going on between the gas distributing companies and the oil companies with whom they have to compete in the marketplace, and I have seen no evidence of that at all.

It is the fact that they come together in the producing sector, where the gas transmission companies and distributors have to purchase from the oil industry, that produces the complication.

The speakers this morning, I think, underestimated one element of this industrial structure that I think is quite important, and that is that it is basically the oil industry considerations which must motivate the oil industry, the oil producers in their economic decisions.

I think the revenue from natural gas at the wellhead is in the order of 3 to 4 percent of the total revenues of the oil companies.

Essentially, their problem is to compete with each other, and very actively, for the end markets of gasoline, fuel oil, et cetera. They need the supplies to compete with each other, the liquid supplies, and they need to make their investments in seeking for those liquid supplies in the most economical, to them, fashion.

They are not going to explore in the United States if it is more—if they can find gas—excuse me, find oil— more readily and more cheaply in some other place. They would be poor competitors if, indeed, they didn't seek to do this; so I think that the emphasis, the attempt to change their policies by the lever of gas price is like trying to manipulate a large boulder with a toothpick. This may be an exaggeration, but the example is there.

Now, one of the witnesses this morning was asked about the proportion of nonassociated gas to associated gas.

This is, of course, an important question, and the question of whether you can drill separately for gas is a very important one and one as to which we really don't know all the answers yet.

There are some places where this is the case. When you drill in the Delaware Basin in west Texas, you're looking for gas, and there are other places like that; and there are, of course, similar places for oil.

But there is a very large middle ground, and whether it's 60 percent of the drilling, or whether it's 80 percent of the drilling, or whether it's 55 percent of the drilling really doesn't make too much difference.

There's a very large middle ground where it has to be a joint search. The wells offshore Louisiana often go through nonassociated gas reservoirs and oil reservoirs in the same well, so that you can't say that a given area is this or that.

So that I think this facet of the industry is important to keep in mind.

Now the next thing I would like to address is the shortage and perhaps a little bit about where it's been and where it's going.

In the first place, the shortage is of two elements. There is an element of reduced production—excuse me, reduced exploration and development—which has been going on now for a number of years, 4 or 5 years.

But there is an even more important element, which is the imposition of an absolutely staggering demand on the gas segment of this country's much greater attention to the environment.

The price of boiler fuel used to be, as I recall it, not too many years ago, let's say 5 years ago, around $2 a barrel, and with the insistence that boiler fuel meet certain sulfur restrictions that $2 a barrel has become $5 a barrel, roughly, for low-sulfur oil.

Now, this increase of 150 percent has completely changed the economics of the gas industry. Before this happened, the sale of boiler fuel to industry, and furnace fuel, was largely confined to the areas nearest to the producing States and to summer sales to even out pipeline flows.

With this change in the value of low-sulfur boiler fuel, there is practically no use for fuel in the whole United States which couldn't be met more economically with gas, until gas goes up to a figure at least double what the present wellhead cost is now considered to be, thinking of the Federal Power Commission's most recent findings of between 35 and 40 cents.

Now, no degree of stimulation of the gas finding activity within the resource base estimated by the Potential Supply Committee, which is the official industry committee which attempts to measure these things, no degree of stimulation within that resource base will produce enough gas to meet what you might call the total fuel requirements of the United States, the total sulfur-free fuel requirements of the United States.

So essentially you have two problems. The first is to stimulate additional search, and that, of course, is desirable. But the second problem is to limit demand for this relatively scarce fuel to the uses for which it is most valuable, and I don't want to make a distinction between residential, commercial, industrial uses as such.

But it is a fact that gas is least replaceable when it is used in relatively small quantities in urban communities where there is a very high investment of the consumer, say a thousand dollars a house in a residential situation, or a good many thousand dollars in an industrial situation.

This is where gas is more valuable, because the cost of replacing it would be the most serious. If you reverted to oil heating in most of the cities of the United States, I venture to say the traffic jams would cause other problems in Washington, compounding the ones that they have now.

So that what we need to do, it seems to me and several witnesses—I think Lee White touched on this—is to direct the uses of gas as best we can to the uses for which it is most valuable to the people of the United States; and by definition of "most valuable," again is the fuel use that is least replaceable, and without sacrificing a good deal of such investment.

Now, I say that is the situation now. That is the situation also—which I say in the attached report—which I believe is going to last for the next 20 years and as far on as we can look.

[The report referred to appears as app. A of Mr. Frazier's prepared statement at the end of his oral testimony.]

We are faced in the United States, and I believe the National Petroleum Council agrees with this, with a period of time when we are going to move out of both gas and oil in the direction of other fuels.

Gas is going to be short, and it is going to have to be supplemented by substantial quantities of manufactured gas; substantial quantities of gas made from coal, oil, and naphtha; substantial quantities of gas, we hope, imported from the Arctic regions, where there is real promise of tremendous reserves but which we can't be too sure we're going to get from our Canadian friends, unless we take a more active role in trying to arrange it; and also imported LNG.

As I see this future picture, it is really just more of the same, but it is oversimplification to say that we are going to cure it by stimulating U.S. findings. We should—many things we should do to stimulate U.S. findings, but it is not going to cure the problems without the rather massive supplements from these other sources.

I have estimated that by 1990, I think it is, some 60 percent of the gas used on the eastern seaboard will have to be made from supplemental sources. So much for the shortage.

Now, the question then comes back to what are the steps that need to be taken, first of all, to induce supply or some increase in supply, and second, what steps can be taken to curtail demand for the less significant uses of gas.

Now, as to the question of whether the oil industry is competitive, I think our problem basically here is one of definition. It is intensively competitive if by that is meant do they compete with each other.

They certainly do compete with each other for end markets for oil and for supplies. What they don't do is try and bid lower prices against each other to capture a gas market. They don't need to.

That market is so wide open that at virtually any price, they can dispose of the gas that they find, in important part, as a by-product of searching for oil.

So that I think we have to recognize that price competition is not a means of keeping price down. Now this does not mean that any federally set prices shouldn't be amply rewarding for the search. They should. But it does mean that you can't rely, in my judgment, on the competition between the oil companies to keep that price within reasonable limits.

Now, I want to—I have to repeat myself in this sense, that I think the important thing to keep in mind here is that we have this man-created difference in values. We decided that we didn't want to have polluting fuels burned in the atmosphere, and therefore we have, entirely irrespective of any of the economics of the oil industry or the gas industry or anything else, all of a sudden increased the value of gas as a boiler fuel by something like 150 percent.

Now this is an increase in value which comes neither from the economics of producing gas—it isn't a reason why it costs more to produce gas. It comes entirely from the circumstances of the attitude of the American people toward the environment.

And I think it's important to realize, when we talk about possible excess value and possible windfall profits, that this differential has been created by social and political action rather than economic action.

Now, I want to turn from that, from the inducing of supply—and I think we can do a great deal with the Department of the Interior on that, because it is true that the offshore areas are the really significant areas—to the question of curtailing demand.

There are essentially three means that I have been able to discern of reducing the rather substantial demand for boiler fuel, which demand is the reason why you have seen these charts with requirements going up and gas supply going down and a tremendous gap in between.

You can do it by Government action. You can say "We are not going to allow you to use gas boiler fuel." It's a rationing procedure; it's been used in the war; it's a directive procedure.

We could say to Exxon, for instance, if it found gas in this field, that we are going to order you to deliver it to the XYZ pipeline, because they need the gas more than somebody else. It is direction of the demand or control of the demand by Government fiat.

I haven't a great deal of faith in it. I would like to think that we were wise enough to select alternative values: That it is more important to use a little bit of gas here than a little bit of gas there, and we think this gas should be directed to that particular market; but I'm not confident we have that wisdom.

I think the Government can set broad guidelines, and I think it should, but I don't think it can do the specific kind of rationing that we got into, in World War II, let's say, for gasoline and meat with coupons and this, and that and the other thing.

I'm not happy with that course. I do want to say, however, if it were the one that were selected that obviously the Federal Power Commission has not now got the power to do it, because they do not have the power, as was stated this morning, to regulate intrastate sales and to direct a gas supply found within a State to particular markets in that State.

Lee White pointed that out, and he recommended, indeed, that you broaden the authority of the Federal Power Commission. Now, I do think there is an element of that authority which might be broadened, and that is the regulation of the so-called intrastate pipelines.

You have all been reading, as an example of this, about the troubles that the firm known as Coastal States has been having recently with the SEC.

There you have a firm which essentially sells both interstate and intrastate gas, and it's really a bit of a fiction to carve out this aspect of the business and say it is business that doesn't affect interstate commerce.

I think there are elements of the FPC authority that could be broadened and perhaps could be broadened without even legislation. I am not a lawyer and I wouldn't want to be too firm on that.

All right. So we have the alternative of rationing by Government fiat. We also have the alternative of total deregulation, which is the one that is advocated by the oil industry. They say that with total deregulation the price of gas would rise to the point where it would be too expensive to use, under boilers presumably, and we would produce a balance between demand and supply in that way, and everything would be hunky-dory.

I really don't feel that is a viable solution for several reasons. First of all, we're not going to totally deregulate. We are still going to regulate oil imports, we are still going to regulate the gas transmission companies, we are still going to regulate the gas distribution companies and the electric distribution companies who are also competitors, so there is no such thing as total deregulation.

You're going to have these prices set in a very controlled market, so that I think to think of a free market operating here is really too fanciful to be taken seriously.

Another concern that I have with deregulation is that if it does—and it would—set a market value for gas that was equal to this $5 a barrel that I mentioned or more, maybe $6 by the next couple of years, you are creating what I think can properly be characterized as "windfall profits"; that is they are profits that have no relationship to the economic cost of producing the gas, particularly for the gas that is produced in the offshore area.

I think that gas is going to be produced, is going to be found and produced in that area, as a result of Government leasing. The oil companies will have to go into those areas to get oil supplies, because they are probably the most economical oil supplies in the United States.

And if they don't, the pipelines and now the gas distributors will fill in any falling off of interest that the oil companies demonstrate.

So that I think you would be giving to these oil companies this, what I'll call windfall profit which was created by social action, that is the upping of the value of the low-sulfur fuel, without any commensurate gain to the consumers of gas or the people of the United States; so I think that is a reason against total deregulation.

Finally, I am concerned that we are unlikely to get total deregulation. We're going to get, if we get anything, some kind of a compromise bill, and from my observation of the Natural Gas Act it's going to take 10 or 15 years to understand what that compromise bill means and what the courts will say it means.

And I'm afraid that we are going to be in for another 10 years of indecision, and indecision in this instance is one of the causes, at least, for the falling off of exploration activity in recent years. It is the hope that maybe things will be better later which defers investment decisions.

Now, while there seems to be a lamentable lack of enthusiasm for an alternative which I am about to propose, I have suggested a modification of what the economist would propose in such a circumstance.

He would say well, if there are these windfall profits allow them to the oil companies but impose an excess profits tax—I believe Lee White more or less hinted at that today—and recapture all those "excess profits" in the form of taxation so that the people of the United States will be the ultimate beneficiary. However, I doubt very much whether anybody could write such a law, and I don't think it would be particularly attractive.

My alternative suggestion is that the Congress impose a tax, and I am not a lawyer, as I said, and I am not a tax expert, but I will call it an excise tax or severance tax which would tax away what I will call the excess between the market value for low-sulfur fuel, which I have called $5 a barrel, and let's say, in terms of gas price, 80 cents per thousand cubic feet, and the cost—the reasonable cost, including highly adequate returns and incentive to produce and everything else, of producing gas.

And impose that tax, if it is constitutional, on the use of boiler fuel, which is what we're attempting to restrain, otherwise on the use of all gas; but pay either the whole tax or half of it—and this would have to be worked out in terms of the amounts of money required—into what I will call a "gas improvement fund."

I have taken as my model the highway improvement fund, of course, where the gasoline tax funds the Interstate Highway System.

There are a number of uses to which this fund could be put. First of all, there is, of course, R. & D. We do need research into the manufacture of the supplemental sources of gas, from coal, from oil. We're proceeding along rather slowly and in a rather cautious fashion in this direction now. We could go and we need to go very much faster.

Second, I think that the Department of the Interior could and should be supported in a much more vigorous fashion to oversee the offshore leasing program. One of the witnesses this morning spoke of the rather limited extent to which they had been able to get into this overnight. "Well, they really didn't know whether this was happening or that was happening." I think they should be on top of the exploration and development work in these leases to a far greater extent. I believe the law is adequate. It does require the prompt making available of the reserves in these areas.

I think they should extend their geological and geophysical exploration work. I think this could even extend to the drilling of test holes in various areas like the Atlantic Ocean to prove out some of the theories that have been advanced as to what might or might not be in these areas. I would like them to be far more informed about what the resources really are in the United States.

I think it could finance this atomic stimulation program.

And then I think the fund could also be made available as a loan fund for the tremendously capital intensive, supplemental gas sources that are going to be required: $400 million for one plant to make gas from coal. If there are 176 plants, which is the number which is rattling around in my head, I can't multiply 176 times $400 million, but it's a lot of money.

There are 40 ships which MARAD says are required at $120 million apiece by 1980. There is a $5 billion pipeline, or more, to the Arctic islands.

The capital requirements to bring gas supply up to what is needed are going to be perfectly enormous, and the gas industry is not going to be a kind of glamour industry that the investment market is going to rush into.

And in order to keep financing costs from going through the roof, it seems to me a fund like this, administered by the Government and perhaps with some industry representation, could make loans on stated terms for these very capital intensive projects that are going to be required to match the reduced demand with supply.

I think that is my prescription, but I want to list a few other things that it seems to me have to go with this kind of a program.

In the first place, I subscribe to everything former Chairman White said about data gathering. We just don't have good data. Now, it isn't that the oil companies are necessarily hiding anything when they report reserves to the AGA. They aren't hiding anything; but they have a definition.

The definition says that if this amount of proving has been done, then you can call it a proven reserve. But in back of these proven reserves, the Potential Supply Committee has estimated roughly an equal amount of probable reserves, and there are possible reserves, and so on.

Really we are in a definition problem, but what we do need to know to the fullest extent is what all of these kinds of reserves are, and we don't know it now.

I think we need to know more about costs. There is no good data on offshore versus onshore costs. The Federal Power Commission has not insisted that it be gathered in that way, and there is simply no way of showing what we believe, that the offshore area is more prolific; that the increased findings offshore more than offset the increased costs, but we don't know. and the FPC doesn't know, and it's got to know in order to regulate effectively.

Mr. CHUMBRIS. May I ask you a question at this point? Can you be definitive with costs? I quoted earlier today, and perhaps you heard it, that Mr. Maguire, a producer from Dallas, Tex., a small producer, at page 67, he said "Costs vary widely from one producer to another."

Mr. FRAZIER. That's, of course, quite right, and when you say can you be definitive, can you say it costs exactly 38.3 cents to find a Mcf of new gas, it's silly. It's an estimate, the best estimate that knowledgeable people can make, but it's still an estimate. It's not definitive, and it's not going to be the same onshore versus offshore.

Mr. CHUMBRIS. The reason why I asked the question, we were talking about how can you get facts and figures on costs. Now, this subcommittee, in practically every hearing that it delves into—automobiles, oil, milk, bread—we've gone into questions of price and cost. You get into the question of confidentiality there.

Would we have a problem in this instance of confidentiality?

Mr. FRAZIER. I don't really think so.

It would be burdensome on the industry to have to report periodically, but I think it should—I'm not asking for any reports that aren't similar to what reports are being made now.

It's just regularity of reporting and, if you will, breaking out the costs, particularly of the offshore versus the onshore.

I would like to talk about costs in a minute. I've just got about four or five more items I'd like to run through. I am talking about increased data gathering that I think probably can be done within existing powers of the FPC, certainly not too much expanded.

But it does require cooperation of the industry, and they have rather naturally resisted the filing of 10-pound questionnaires, and this kind of thing, from time to time.

I can understand their resisting it; on the other hand, I think the information, much information, is required.

I think, passing from data gathering, I think we've got to increase, as I stated, our research and development expenditures because we're going to have to move away from what now seems the good old natural gas days.

I think that the Interior Department leasing program has to be made much more directive, have much more oversight, and I would hope they would get away from the lump-sum bidding process, which makes it almost impossible for anybody who doesn't have $50 million to enter into this field of exploration.

I think we, as a part of that effort and as a general ongoing investigation, I think we should try and find out much more than we now know about the resource base. We can't have the Department of the Interior in one bureau saying that there's 6,000 trillion Mcf of gas to be found, and in the industry saying there's 1,000 trillion. It makes an awful lot of difference whether it's 6 to 1 or 2 to 1, and I think we've got to get decent information on this point.

I don't know what the Department of State is doing with the Canadian Government. We know that the Canadians offered an agreement of some sort a year ago, which apparently wasn't responded to by our Department of the Interior.

I don't know whether there are any efforts going forward to develop an energy concordat with the Canadians. I know that there are tremendous problems there.

The provinces of Canada are at odds, if you will, with the central Government, the eastern provinces are at odds with the western provinces. They've got some of the same problems of nationalism that every country has. However, I don't know whether we have exhausted all our efforts to develop what I will call an energy concordat with Canada, but I'll bet we haven't. And I wish some of our efforts to arrive at an agreement with the Russians would be directed to the north, because it is thought that the kinds of reserves that are in Siberia could be under the equivalent areas in this continent to those Siberian fields, the Arctic Circle reserves. The reports that we see are very encouraging.

I think the Government—whatever the appropriate agency is, and they change every year—should develop a much more sympathetic attitude toward the development of supplemental gas resources; such as the importation of feedstocks from the manufacture of gas and the speeding up, if you will, of the applications to import LNG.

These fuels are going to be needed, no matter what happens to domestic supply. The foot-dragging evidenced in the case of the recent action of putting a rather large fee on improving of feedstocks, impede the efforts of the gas industry to attempt to meet their franchise obligations.

Finally, I would hope that the Federal Power Commission would change its apparent policy of discouraging distributors from engaging in exploration and development of gas reserves themselves.

It is the gas distributors of this country who have the franchise obligation to supply their people, their customers, with gas, and they can be counted on, I believe, to do so. We are seeing it now—you see this development in all parts of the country really, of distributors entering into this field. I think it's very important that they do so.

The same thing, of course, applies to the pipelines who have a financial obligation, if not a franchise obligation, to meet their contracts.

And I think our emphasis—the Commission's emphasis—should be on encouraging the distributors and the transmission companies to go into the exploration and development field themselves, rather than, as it is apparently doing now, discouraging this effort, because according to some elements in the Federal Power Commission this leads to vertical integration.

I think it's rather silly—for 125 years the gas industry was vertically integrated. They made the gas, they distributed it. And so it's only been in the last 20 years or so that the gas distributors have depended on natural gas rather wholly, and now they are going back to a former style of life, which does include in this respect increasing their exploration efforts.

That's a little shopping list I have of some of the things I think might be done to improve the situation. Thank you.

Senator HART. Thank you for the shopping list and the style and ease with which you presented it.

On the question of controlling intrastate gas—you comment on it in your prepared testimony as well, and you suggest that could be accomplished without too much difficulty.

Based on your experience, how would it work—how would you do it?

Mr. FRAZIER. I don't think I said it could be accomplished without too much difficulty. I said there was an element of it, which was the sales of these rather small handfuls of pipelines, called intrastate pipelines, which by some rather broader definition of pipelines that could be controlled, could be brought under the jurisdiction of the Federal Power Commission, I believe.

The Federal Power Commission has already done this in respect to one pipeline, the United Gas Pipeline, the Pennzoil Company, it's called now, in which they have brought in a rather large hunk of intrastate gas sales under their certificate jurisdiction.

I don't think the total control of the market is going to work, Senator. I don't think you can take, in our kind of mixed, free-enterprise government system—I don't think you can order Exxon, if it finds some gas in a field in Texas, to deliver that gas to a particular market, which essentially seems to me what the control of intrastate—total control of intrastate sales—means.

That's why I prefer the price mechanism to do this.

Senator Hart. And you did remind us that the gas business until the very recent past was a completely integrated, vertically integrated operation.

Mr. Frazier. I was with it in that form for more years than I've been with it since—no, that's not quite right. Fifty-fifty, 25 years manufactured and 25 years natural.

Senator Hart. But I'm certain that this subcommittee would be unlikely to join you in that part of your prescription, even though we concede that historically that's the way it was.

Mr. Frazier. Well, it's certainly not so now, and it's never going to be so totally again, because the major oil companies are going to find gas, and they are going to provide a very important number of the trillions of cubic feet that will be required to meet supply.

All I am saying is they are not going to meet even a very shrunken and restricted measurement of demand, even with the boiler fuel squeezed down, shall we say. And again, all these things require time—there couldn't be any immediate cessation of boiler fuel nor should there be.

The most that you can do at this point, it seems to me, is to restrict growth in that market and perhaps gradually, as nuclear takes over, see a falling off of the present use.

Senator Hart. And that energy concordat that you talked about, we haven't heard that before. Why not? You know, let's try.

Mr. Frazier. Well, I like to think, Senator, that people are reasonable. I like to think that we could talk to the Canadians as reasonable people at a very high level and point out some of the advantages.

After all, we are putting all the money up essentially; not all the money but a very large proportion of the exploration expenditures in the Arctic is made up of U.S. dollars, and I hope we're not doing it just for fun.

But I suppose there's $100 million, $200 mililon, that's been spent up there, and I don't think we have any assurance that it's going to come back in the form of gas. It worries me a little bit though I don't have any of my money there.

Senator Hart. In so many areas, though, we have learned the Canadian sensitivity about the presence of American capital or their association with it is enormously high.

Mr. Frazier. I quite agree. And you have other problems in Canada in the English-speaking, French-speaking problem, but it seems to me so important that a really major effort is required, and if there is such an effort it's not visible.

Senator Hart. I think there isn't—the reason it isn't visible is there isn't that kind of effort. Mr. Frazier. I agree with you there should be.

Mr. Nash?

Mr. Nash. No questions, Senator. Thank you.

Mr. Frazier. You were going to ask about cost and——

Senator Hart. Mr. Chumbris was.

Mr. Frazier. Yes, I would like to say one thing, I think, that would set the record straight a little bit as to Chairman White's testimony.

The amount of reserves found is a very important factor in determining what is called the cost of new gas. This is essentially made up of two measurements.

One is the measurement of the cost of drilling a certain number of feet of successful gas well, and the other, divided into that, is the measurement of the reserves that were found, and it is that division which is highly important to determining whether gas costs 30 cents or 70 cents.

So it makes it tremendously important and the two measurements are made on a consistent basis, and I rather strongly suspect that the reason why the majority of the Federal Power Commission come out with a rather large figure for cost is because they have taken a measurement of reserves found, which rather inadequately measures what actually has been found in the last couple of years, keeping in mind this "proven," "probable" business, and stacked it up against a very much higher cost of drilling wells which has taken place again in the last couple of years.

So I think we have higher finding costs that have outspeeded, outstepped, shall we say, the collection of data on what has been found.

That's why this whole question of definition, of accurate reporting, of prompt reporting of findings is important in the measurement of cost, of the unit cost of finding gas.

Mr. CHUMBRIS. When I raised the question of cost, I did it primarily because it was raised by some of the witnesses in the last 3 days.

As I understand it, in the *Belco* case the two economists for the Federal Power Commission in effect agreed that 35 cents per thousand cubic feet would be reasonable because of the costs involved, and the majority voted for 45 cents, if I read the record correctly, and——

Mr. FRAZIER. Not necessarily based only on cost.

Mr. CHUMBRIS. Yes, I understand. That was the figure they reached, and Chairman Nassikas dissented to that increase to 45 cents.

You mentioned something about getting data on cost. The reason I raise the question is how would you go about obtaining that data in such a way that wouldn't violate the trade secrets of each individual company?

Now, we have had that problem before this subcommittee time and time again. As a matter of fact, during the automobile hearings the records were subpenaed and the companies negotiated with the subcommittee, and the subcommittee agreed, Mr. Chairman.

These were in 1953 hearings, so the chairman wasn't here at the time, and I remember distinctly Senator Kefauver called a brief recess and the Senators got together and agreed that if the automobile companies could submit the data of each of their respective companies for a period of about 5 years, so that in doing so it would reach a total so that Ford wouldn't know what the costs of General Motors were and American Motors wouldn't know what the costs of Ford were, and so on.

Because each of those companies felt that those costs were confidential and trade secrets and didn't want them divulged in the public hearings. That's what I'm saying.

Mr. FRAZIER. That has been solved. That has been solved, in more or less the same manner, by the Federal Power Commission, in that they have received those confidential reports and composited them in such a way that the individual costs of each company could not be identified.

But that is the outgo of those costs, and what I'm concerned with is not the outgo but what is found, and I think a lot more attention needs to be paid to this definition.

How are you going to match these reported numbers of what we spent with what was found as a result of spending this money—I think that is the area that needs work, and I think it can be done without infringing on the confidentiality of the various operators.

Mr. CHUMBRIS. I wanted to say, Mr. Frazier, I read with great interest your entire paper and some of the exhibits that you have placed into the record also.

It brings back memories to me, because I have mentioned it before during these hearings, I was assistant attorney general for the State of New Mexico when the *Phillips Petroleum* case started in Bartlesville, Okla., back in 1951, and followed it on through the court of appeals and then I left it at that point.

So many of the things you were saying, and Mr. Lee White was saying in his paper, going back to the days when they were flaring gas because you couldn't even get 3 cents per thousand cubic feet, much less 5 and 6 and went up to 8 and on up, as we have had related during these hearings.

You did have a very interesting paper. I imagine there are some views that you have expressed in here that some of the succeeding witnesses may disagree with, but that's up to them to pick it up out of the record and respond in such a way as they deem necessary.

Mr. FRAZIER. Well, that's why I said it was a personal statement and not subscribed to necessarily by anybody.

Mr. CHUMBRIS. And I thank you for coming.

Senator HART. Again, Mr. Frazier, thank you for what I believe to be as helpful a presentation as we have had in the 3 days.

Mr. FRAZIER. Thank you, sir.

[Mr. Frazier's prepared statement follows. Testimony resumes on p. 589.]

PREPARED STATEMENT OF CHARLES H. FRAZIER

My name is Charles H. Frazier. I am an independent public utility consultant, associated with National Economic Research Associates, Inc. (NERA). Both in this capacity and in respect to prior employment with the Philadelphia Gas Works, for some twenty-five years, and earlier employment with other public utilities, I have been associated with or retained by gas and electric companies since 1927. During the period 1947 to date this experience has taken the form of participating in many proceedings before the Federal Power Commission, involving producer and pipeline rate and certificate proceedings. I have testified in virtually all the area rate proceedings, beginning as the "Examiner's witness" in the Permian Basin proceeding in the early '60s.

While NERA is currently retained by Associated Gas Distributors (AGD), a group of some sixty East coast distributors serving some ten million customers, this statement is not submitted on behalf of any one client, or even group of clients; nor is it submitted on behalf of National Economic Research Associates. Rather, it stems from a distillation of my own experience with the gas industry and its regulation over the last quarter century.

I can best lead into the statement by quoting from Senator Hart's letter outlining the areas of interest for which the Subcommittee has scheduled these hearings, as follows:

"The Subcommittee has scheduled hearings on the nature and extent of competition, the degree of concentration, and the extent of concentration of control of reserves in the natural gas producing industry. We are most interested in the relationship of the foregoing to present proposals to deregulate the price of natural gas at the wellhead and the effect of such industry structure and action on consumers. This obviously also requires an assessment of why we are experiencing a natural gas "shortage", proposed alternative solutions, the adequacy and effect of FPC regulation over the past 5 years, and the consumer effect of recent FPC decisions and proposals. We are also interested in obtaining information with respect to the adequacy of information on reserves as well as the recent FPC actions and proposals aimed toward de facto deregulation."

However, before responding to the specific questions, it seems to me desirable to devote a prefatory section of this statement to the nature of the structure of the "industry" which is here referred to.

GAS INDUSTRY STRUCTURE

When people speak of the gas industry, it has been customary to divide it into three segments: the producers, the pipelines, and the distributors. Essentially this seems to me to be a singularly unhelpful analysis. The gas industry per se, in my view, consists of the transmission and distribution segments. The so-called producing segment is not, except to a relatively minor degree, a gas industry "segment," but rather a part of the much larger oil industry.[1] A few "integrated" distribution companies do produce a small fraction of their gas supply and some "integrated" transmission companies do produce a similarly sized fraction of the gas which they transmit. However, by and large, natural gas in America is now produced from reserves controlled, in large part, by the major integrated international oil companies.

There are two reasons why it is essential to make this distinction. In the first place, the activities of the latter group of companies are dictated in large part by considerations relating to oil prices, supply, and marketing. It is these considerations which, by and large, determine the scale of the industry's efforts in the exploration and production field. Essentially it is the field price of oil which makes domestic production profitable and it is the demand for physical volumes of oil which determines the scale of the effort at any given time. It is the relationship of domestic to foreign production costs which governs, to an important extent, the industry's choice of location for its E & D efforts. As is well known, gas is discovered and produced to a significant extent from the undifferentiated search for hydrocarbons. It is true that there are some areas such as the deeper reservoirs in West Texas and certain producing areas in the mid-continent area which are predominantly "gas areas," and there are other areas where gas is more likely to be found in greater quantities than oil. In such areas gas price may be a relatively effective device for eliciting gas supply; but this represents only a fraction of total gas supply. By and large[2] it is the oil wellhead price which is the most significant determinant of the scale and profitability of the exploration effort.

The second reason why this distinction is important is that virtually throughout the range of markets served by the gas industry, oil is one of the principal competitors. Thus when people talk about letting gas reach the "market clearing price" it is important to realize that this price again is determined, importantly, by considerations within the oil industry. The extent to which this is so requires a brief analysis of the nature of sales at the retail level within the gas industry. I am attaching hereto a report (Appendix A) recently issued by Associated Gas Distributors containing tables[3] showing the breakdown between different classes of customers in the gas industry, nationally and on the East Coast; and a similar set of tables as to the projected source of the gas. Finally, a chart is appended (Appendix B) showing the geographical description of gas sales in the latest report of the Future Requirements Committee. This latter is important because historically gas has had no competition in the West-South Central States—generally speaking, the producing areas in the United States—and little competition at retail in the states within, say, a 1000-mile radius. Now, however, with the "shortage" (which will be discussed subsequently) it is the industrial and electric generating requirements in these states which will, in important part, determine the "market clearing price" for gas nationally, i.e., the prices at which gas can be sold in competition with low-sulfur oil.

In the large nonproducing area, essentially the whole area between the Rocky Mountains and the Appalachian Range and north of roughly the 38th parallel, gas has also had relatively little competition in recent years; but long before gas is priced out of the residential and commercial markets in that area, it will be the industrial price which will in major part determine the size of the gas demand in those states. Along the East and West coasts, however, gas is in close price competition with either oil or, in some cases, electricity. Particularly on the East coast the market clearing price would be, importantly, determined by the price at which home heating oil is sold. To a significant degree, therefore, this so-called market clearing price derives from intra-oil industry considerations. Furthermore, in a period of short supply the oil industry determination of the market clearing price for industrial sulfur-free fuels (also, at least in the near term, in short supply) in the producing states will determine, in important part, what share of the gas there discovered is, likely to be made available to the interstate, national market.

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[1] 3.3 percent of the oil industry's revenues in 1970 were from gas wellhead sales (The Chase Manhattan Bank, *Financial Analysis of a Group of Petroleum Companies 1970,* August 1971.)

[2] Good statistics in this area, as elsewhere in relation to hydrocarbon reserve matters, are hard to come by, as they are closely held industrial secrets; whether it be for fear of antitrust prosecution, or derived from competitive concerns, the result is the same.

[3] Tables appearing at pages 4 and 5 of the text, and Tables I and II of the Appendix.

It is important to note at this point also, the essentially geographical distinction between the "interstate" and "intrastate" markets. Roughly one-third of the gas supplied and sold is beyond the jurisdiction of the Federal Power Commission, as being consumed in the state of production, generally in the South Central states. With oil prices restricting demand for boiler fuel and enough gas for all, this distinction was of little importance. Now with the ability of the intrastate gas market to outbid the interstate market, virtually regardless of FPC action, the distinction becomes vital.

THE SHORTAGE

Another prefatory note needs to be directed to the nature of the gas shortage This shortage is, of course, quite real, in that gas distributors in a number of communities are curtailing the amounts of new gas business which may be attached, and in those communities and others, sales to industry, largely in the interruptible category, are also being reduced.

It has an induced quality, however, at least in this respect, that with the greater attention to air quality presently being paid and, beginning most intensively two to thre eyears ago, the whole nature of the "market for gas" has changed. Up to 1970 price did limit the market for gas as an industrial fuel. in most of the country. This can be seen from Appendix B which shows the far greater proportion of gas sold in the South Central region, in comparison with the rest of the country. It used to be that in most of the country, and until 1970, gas could not be sold for major industrial and boiler fuel uses, except to fill summer valleys, at the cost of producing and delivering gas to those markets. This automatically restricted the gas market for industrial and boiler fuel use to a "manageable" proportion of U.S. fuel requirements. Now, however, with limits imposed as to the sulfur content of fuels which can be burned, the price of industrial fuel has increased by between one hundred fifty and two hundred percent. Therefore, almost no assessment of gas demand at prices which can be justified by cost consideration will bear any reasonable relationship to the amount of supply which even substantially higher prices could be expected to elicit. In sum, therefore, we have what might be called a "tractable" shortage produced by a dip in the volume of new reserves currently being made available, but a virtually "intractable" shortage being produced by the nature of the market which gas could now reach, given current environmental concerns. It is important to make this distinction.

REASONS FOR THE SHORTAGE

Having touched on the nature of the gas shortage, and particularly that portion of it which has been termed "tractable," it is important to sort out some of the basic reasons therefore, if we are to consider what remedies there may be. In contradistinction to the gas industry which is nearly 150 years old, the natural gas industry as we know it today is essentially only 25 years old. Natural gas did serve many markets pre-World War II, but it did not become the national gas fuel until the post-war period during which time the great majority of the major pipelines spread out to serve most of the rest of the country. The underpinning for these pipelines was the tremendous volume of proven reserves which was made available by the enhanced oil drilling of the '40s, and the wartime restrictions on pipe production. Consequently, for the first half of the life of the current phase of the gas industry, reserves were never a problem. Moreover, while the stated proven reserves could only take care of a finite number of years of the gas supply for the then market, it had been an established fact in the oil industry that this measurement, i.e., x years supply, was no indication of the oil that could yet be found, and it was reasonable to suppose that the same circumstance would pertain to the gas segment. During the first period, say from 1948 to 1960, gas field prices mounted rapidly. Whereas the early gas sales to the first pipelines were on a 5-cent and 6-cent Mcf basis (and on the basis of which the pipelines were deemed feasible), this had mounted roughly four-fold by the time FPC regulation began to be marginally effective (1960). It is true that the Phillips decision was rendered in 1954, but the Eisenhower years were marked principally by an apparent desire on the part of the Federal Power Commission that the problem would go away.

The decade of the '60s represented a transitional period. Supply was still adequate and, indeed, in the first part of that decade, appeared at least to exceed demand. However, this was apparent rather than real, as early as 1957, the post-war surge of oil industry exploration and development activity reversed itself. This was principally apparent in the overall industry's drilling statistics which, importantly, reflected oil values; the successful gas-well data only turned down some years later as the need for development drilling declined.[4] One of the reasons for the "shortage"—the tapering off of rate of discovery of domestic supplies—could thus have been foreseen a number of years ago. This same period of decline in oil industry activity was followed, some four years later by the appointment of a Commission marked by a stiffening of regulatory attitude; although regulatory uncertainty was prevalent throughout (and, of course, still is).

At the end of the decade of the '60s, additions to proven reserves started to turn down, in very important part as a result of the steady decline in oil industry activity in the contiguous 48 states, but probably influenced by regulatory uncertainty and by the effect of regulatory lag on justifiable price increases. Regulatory lag plagued decision-making in the '60s and rendered it almost certain that the prices then found, and particularly the new gas price, which was supposed to be the supply-eliciting factor, probably lagged behind cost realities from 1965 on. In essence we can say of this period (the '60s) as far as regulation was concerned, that the fact of regulation probably had some effect on gas finding (most importantly, because of the factor of regulatory lag); though this was not the principal reason for the decline in oil industry exploratory activity.

The beginning of what might be termed the shortage period, i.e., 1968–1969, might be said to be marked by a confluence of three important factors: the first was the marked increase in gas demand caused by air quality considerations mentioned at an earlier point; the second was a near paralysis in regulatory ability to keep new gas prices abreast of current costs; and the third was the beginning of a new phase of regulatory uncertainty. As to this third factor, beginning in 1969 producer expectations could be said to have improved very considerably either on the basis of hoped-for relaxation of regulation[5] or on the basis of improved market expectations resulting from environmental pressures. These substantialy improved expectations would, paradoxically, have had the tendency to delay investment in gas development until the improvement expected became a reality, at least insofar as this factor affected investment decisions.[6] The effect on the volume of new gas reserves reported annually was startling, and this at a time when demand was stimulated because of environmental concerns. The shortage surfaced only a year or two later; thought it was foreseen well before them.

THE DURATION AND FUTURE COURSE OF THE SHORTAGE

From a discussion of the shortage and the part which the FPC did or did not play in bringing it about (mostly the latter), I turn to the question of the duration and nature of the shortage in future years. Submitted as Attachment A is a report prepared by Associated Gas Distributors, which looks ahead, essentially for the visible future (to 1990). In sum, the forecast envisages stabilization and then gradual decline in domestic natural gas supply, a limiting of demand increases by pricing policy, regulatory or other action to increases in the "high priority areas," though with some falling off of total boiler fuel demand, and a resulting degree of marked shortage continuing until toward the end of this decade. By that time should come the fruition of various investment decisions already made, or to be made, which will supplement natural gas supply by various other sources of gas, notably gas from coal, in increasing quantities beginning around 1980; gas imported from the Arctic regions, beginning perhaps a year or two earlier; synthetic gas made from oil and its products, beginning in significant quantities by 1975; and substantial imports of LNG, largely from Algeria, beginning in the latter '70s. In terms of the actual volume of the supplemental sources, which will make up over a third of U.S. gas supplies by 1985, these are listed in roughly the order to which they can contribute the difference between domestic demand and supply. It should be noted, therefore, that federal action in relation to these various other sources is probably more important to a determination of total supply than the differential effect of what is done with respect to field price regulation. These actions will be summarized at a later point in this statement.

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[4] Well drilling is of two types, wildcat or exploratory wells, and a much larger volume of development wells if the exploratory well proves successful. Most of the former drilling results in dry holes some 90 percent of the time, so the only fact-based division of drilling into oil and gas categories is in the successful well category, dominated by the development wells.

[5] This same period saw a recrudescence of deregulation legislation long dormant.

[6] The same factor applies, of course, with respect to oil.

So much for the gas industry background, leading up to the current interest in, hopefully, remedial legislation. The most immediate question confronting the Congress is the legislation proposing the "deregulation" of new gas prices. There are also measures proposing total deregulation, but attention to these measures appears to be less imminent because of its staggering cost to the consumer and lesser value in eliciting new supplies. It is, of course, the new gas price which is most important, of all gas prices, in eliciting supply.

WORKABLE COMPETITION IN THE NATURAL GAS PRODUCING SECTOR

If there were effective price competition in the field, this might be the easy solution, but for various reasons this is not what the record shows.

In the Permian Basin[7] proceeding, the lead area rate case, the Commission heard competent, well-tested testimony on this subject, from all major parties to the case. On the basis of that record, pre-shortage, it concluded that while the concentration ratios for the producers were not disturbing in themselves, the industry structure (previously referred to) and the institutional and regulatory circumstances in which it operated were such that price competition could not be relied on to produce the lowest reasonable cost of gas to the consumer, the Congressional goal in passing the Natural Gas Act. Until recently, it has never disturbed this finding. In a recent proceeding,[8] in the face of the evidence of an FPC Staff economist reaching the same (Permian) conclusion, however, it went to extraordinary lengths to excoriate the Staff for even considering the issue (Chairman Nassikas vigorously dissenting), and on the basis of little, if any, evidentiary support, citing only the Fifth Circuit Court's paraphrase of Permian, found the producing industry to be "structurally competitive" (which is not the issue) and by implication reversed the Permian conclusion that the market cannot be relied upon to produce the lowest "just and reasonable" prices.

There is little point, I conclude, in retreading the ground as to concentration ratios; they haven't changed *that* much over the last decade. The Staff finding that the eight largest producers made 64 percent of the 1969 sales is representative of all the analyses that have been made as to concentration, and indicates the dominance of this small group of majors. The most recent Staff report, stating that the largest four companies control nearly half the uncommitted supply is of the same nature. However, in this connection I would like to refer to a data gap which is disturbing, if one seeks *relevant* information as to *future* price behavior. The significant factor, however, is not the degree of control which has existed in the past. There, in the days when the pipelines were scrambling for supplies, the handful of majors possessed an influence over the "birth rate" of pipelines to a very significant extent since no pipeline could be "put together" without their cooperation. Now the situation is rather different, but the degree of control may be just as marked. It is not now particularly important who controls existing proven reserves. These are already committed, in very important part. What is important is who controls or is aware of the "probable" reserves. Probable reserves is a descritpion adopted by the Potential Gas Committee[9] to lying) reserves which are currently being produced, but have not been exactly quantified for purposes of the "official" definition of "proven reserves." These reserves are estimated to be 212 Tcf (trillion cubic feet) for the contiguous 48 states.[10] This represents the next ten years' supply of natural gas for the United designate the reserves which are known to be adjacent to (or overlying or under-

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[7] Permian Basin Area Rate Case, 390 U.S. 747 (1968).

[8] Belco Petroleum Corporation, Agent, et al., Docket Nos. CI73–293, et al., Opinion No. 659, issued May 30, 1973.

[9] Potential Gas Committee, sponsored by the Potential Gas Agency, Mineral Resources Institute, Colorado School of Mines Foundation, Inc., Golden, Colorado. "Probable" supply refers to the unproved portions of existing fields.

[10] The Potential Gas Committee has two other "less likely" categories which, however, will require substantial additional exploratory effort to make available. These are defined as "Possible" supply, i.e., that which will result from new field discoveries in areas of established production and "Speculative" supply, i.e., that which may result from new field discoveries in areas where sediments are present but have no prior production history.

States. Concentration with respect to *these* reserves is totally unknown to the Federal Power Commission (or to anyone else except perhaps the companies contributing information to the Gas Supply Committee).

Furthermore, much of the *acreage* providing access to reserves is also controlled (leased) by the prospective producers, and this information as to concentration in this area is likewise totally missing. This, of course, is equally important since it is only with the cooperation of those who control the acreage that the future reserves will be discovered.

Irrespective of whether these concentration ratios are disturbing in themselves, the problems in relation to industry structure are, if anything, more severe than they were ten years ago because of the changed circumstances of the oil industry, with domestic supplies running down, and the related gas shortage. We may assume that under today's conditions the major integrated oil companies are finding and producing all the oil *in the contiguous 48 states* which their circumstances indicate is economic; and that because of the dominance of oil in their computations, an upward shift in the gas price would have to be astronomic to produce a significant change in this level—another way of saying that gas supply is price inelastic.[11] Who then will be the entrants if the new supply is to be raised by, say, 50 percent—a reasonable improvement target. Simple mathematics would tell us that the effort of the nonintegrated oil companies would have to treble. Again considering the dominance of oil price in the exploration scene and failing a major increase in oil-wellhead prices, this is highly unlikely.[12] We are left with the conclusion that in the domestic hydrocarbon shortage era, price competition will be ineffective in controlling the price of gas, short of gas prices meeting the several hundred percent increase in the market value of low-sulfur fuel.

PROPOSED LEGISLATION

Despite this conclusion there are plausible reasons advanced supporting decontrol. Principal among these reasons is the desirability of achieving a balance between demand and supply, without action by government fiat. We have seen that if a balance is to be reached, the control of demand is likely to be the most important factor. The inducement of added supply is, of course, important, but as we have shown under the discussion of the nature of the shortage, no visible enhancement to supply, constrained by the limitation of the size of the resource base in the United States, is likely to satisfy potential demand at any cost-related price (and if not cost related, what can be the basis for regulation?). I have also argued, and this is a point where most oil industry sources agree, that it is basically oil price and supply conditions which will be the principal regulator of gas supply. Here the outlook for an enhancement in domestic activity is not favorable, since the U.S. oil supply resource base is in worse shape than the gas supply base and the world market is vastly more important and accessible. I would sum up my conclusions as to the influence of price on supply as being that under either regulation as now practiced or nonregulation, we may expect prices high enough to have a positive effect on gas supply, but constrained by resource base and other limitations. This supply effect by itself, however, will come nowhere near to bridging the current gas between supply and true demand at current prices.

Let me turn next to the shaping of the market to be in accord with the realities of the situation. If gas supplies, both natural and supplemental, have a

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[11] The price elasticity of supply is a significant factor in determining which course is the least expensive for America to follow in bringing supplemental supplies to market. *Some* discovery activities will proceed at present prices. If, say, a 20 percent increase in those prices produces as much as a 10 percent increase in supply (an estimate of some competent economists) the cost of *that* increment will be higher than the costs, often cited as justifying a price increase, of LNG and manufactured gas. Incremental cost may be computed using the following formula:

$$\text{Incremental Cost} = \frac{\text{New Volume @ New Price minus Old Volume @ Old Price}}{\text{Increment in Volume}}.$$

For example, 1 Mcf, with a 20 percent increase in price producing a 10 percent increase in findings, and using 45 cents as the base price, yields the following incremental cost:

$$\text{Incremental Cost} = \frac{1.1\ \text{Mcf} \times 45¢ \times 120 - 45¢}{.1\ \text{Mcf}} = \$1.44/\text{Mcf}$$

Under these circumstances, the latter might be the more economical course to follow.

[12] An exception to this general rule is a heightened interest in exploratory activity by gas distributors and pipelines where the sheer need for physical volumes of gas to meet franchise and contract requirements is an important make-weight in the decision making.

long-run incremental cost vastly in excess of current average costs, this limited supply should be preserved for uses for which, from the standpoint of national interest, it is least replaceable. This excludes the very large fraction of gas which is used simply as boiler fuel, or other similar industrial uses, which can be replaced by low-sulfur oil, to be made available in increasing quantities, by coal as technology permits, and by nuclear fuel. There are basically three ways in which the size of the gas market can be contained to a size reasonably commensurate with probable gas supply (including supplements). The most obvious way is by government rationing, not now legally possible since the FPC does not control a very large fraction of this market,[13] though Congress could, of course, broaden its authority.

The second course, the alternative to such government rationing, is the course of deregulation. The market would then "bid up" the field price of gas to the limit set by low-sulfur oil value equivalency, and demand could thus be limited to new supply made available. For the first part of this period, the intrastate market would be satisfied, and while the demand-supply balance is being achieved (1980?), the interstate market, particularly on the East and West coasts, may receive a shrinking portion of total supply. We may then expect price increases to confine and even shrink the demand for boiler fuel, at which point the remaining demands will be satisfied, though at a substantially higher price. Whether firm gas demands will be importantly affected depends on many imponderables during this period—the price and availability of competing fuels, and the availability of supplemental gas supplies.

The third course of action (to which I will return at a later point) is in the nature of a compromise between these two, where the Government would, by taxation, increase the field price to a point where it is essentially equal to this "market-clearing price" and attracts, at the least, no new industrial boiler fuel demands. The distinction between this course and the former two courses is, with respect to the first alternative, that the Government would not be making rationing decisions as between all the various uses; rather, it would allow differential pricing action to accomplish this (aided, of course, by taxation). Second, the windfall profits, i.e., those which perform no proportional supply-eliciting function would be taxed away to accrue to the public benefit.

I would like to turn now to a fuller discussion of each of these alternatives. The first is FPC regulation as is, with more comprehensive and permanent rationing. I have pointed out that the present, partial regulation cannot really accomplish the desired result if it does not reach out into the intrastate market. It is up to the Congress, of course, to determine whether the latter is feasible and appropriate. As one who has learned a certain amount of economics by osmosis, I do, however, have grave concern for the success of a rationing policy by a federal agency which is presumably designed to go on forever. While I do not think that adding jurisdiction over the so-called intrastate pipeline companies is inappropriate, since their actions do indeed importantly affect interstate commerce in gas, which is regulated, my basic objection to permanent government rationing and allocation procedures remains.

As to the second alternative, abolition of new gas field price control, I would point out that, in important part, this has already been accomplished—though not court tested. The *ad hoc* adjustments to the shortage situation which the FPC has adopted in effect force the pipelines to meet the market requirements and prices of the intrastate market, irrespective of "reasonable price" considerations. The reason why prices have increased from 25 cents, thought reasonable two years ago, to 45 cents, talked about today and 60 cents approved on emergency bases, has little to do with increasing cost [14] and is essentially due to the up-to-two hundred percent increase in low-sulfur boiler fuel value. No change in the system of regulation is apparently needed, in respect to the onshore gas supplies, if the present system is followed, and the effective price is determined by the intrastate market. I emphasize onshore gas supplies because, from the standpoint of the increasingly important offshore areas, the FPC and the Department of the Interior can, between them, control and direct the price and market for these supplies under their present grants of authority. Indeed this *de facto* compromise between a reasonable standard of regulation (offshore) and nonregulation (onshore) may be about all that can be accomplished in this field, given the industry structure, where essentially the oil company producers are, in the major part, unregulated entities. I conclude, in respect to deregulation, that legislation requiring the deregulation of new gas prices charged by independent producers has three major disadvantages: (1) by changing the Act it would introduce another ten-year period of uncertainty as to how the new legislation would be interpreted and administered; (2) it would increase the price of *offshore* supplies to the ultimate consumer without any supply-enhancing virtues not presently attainable; and (3) would permit the economic rents resulting from the environmentally related increase in value to be retained by the oil industry.

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[13] Much of this market, unquantifiable however by lack of publicly available data, could be controlled by FPC if it extended its jurisdiction to a handful of major intrastate pipelines, a stretch of its jurisdictional authority which in the shortage situation could be ruled permissible under the Natural Gas Act as now written.

[14] I have included as an appendix hereto (Appendix D) a discussion of the problems in respect to current cost finding.

As to the third alternative that has been suggested, which subsumes the continuing of regulation, its usual form has taken the part of suggestions by economists that excess profits of producers be siphoned off so that the windfall profits above described, resulting in major part from environmental considerations, would essentially go to the benefit of the public at large. No one has, however, yet come up with a device by which this can be done, given the nature of the oil industry—indeed it may be rather totally impossible of accomplishment. The suggestion which I have advanced is that much the same result could be achieved by the imposition of a federal severance tax, or excise tax, imposed at the first point of sale, which would "sop up" the margin between low-sulfur fuel value and the cost of production.[15] This tax could be imposed in stages, to soften the consumer impact. A feature of this tax is that it could, if deemed constitutional, be differential and that it might be imposed on gas intended for boiler-fuel use and thus eventually raise the cost base of such sales to that market-clearing price without burdening all consumers.

I should note at this point that this reference to boiler-fuel use does not imply that I am arbitrarily putting residential consumers ahead of industrial consumers in an exercise of imposing what on the surface would appear to be social (or political?) values on an economic function. Rather, I am recognizing the fact that natural gas is a wasting resource which will have to be replaced by some much more expensive synthetic fuel for those uses (including industrial) where its form is of particular value, and it makes no sense to use up enormous quantities of it for uses (largely under boilers) where other fuels *can* be substituted during the temporary period (a decade or so) when electric plants and other large industrial users are adjusting themselves to the age of nuclear or fusion-derived energy—or learning how to use coal in an environmentally acceptable manner. Government energy policy should be concentrated on hastening that transition.

Another feature of such a course would be that all or part (say, one-half) of this tax fund could be paid into a "gas improvement fund" similar in nature to the gasoline tax which now goes to support the interstate highway system. The funds so made available could thus be retained within the gas industry and accrue to the benefit of the consumers thereof. It does not need to be elaborated on that R&D in gas manufacture from coal is seriously underfunded; that a different form of R&D—the exploration activity by the proprietor of lands in the offshore areas, the federal government, is seriously underfunded, and that the new supplies of gas required to supplement traditional sources will require vast amounts of capital which could be devoted to loans to the industry units who are required by this situation to make these extraordinary investments. This could include the coal to gas plants, potentially a national grid system to make such gas available, perhaps investment in the Arctic gas pipelines, and in shaping required for LNG supply. The sums so made available, mounting to over two billion dollars a year, would not, during the next five years or so, begin to exhaust the possibilities of gas-improvement funding of such a nature.

The essential difference then between alternatives two and three relates to the uses to which excess revenue generated from higher gas prices will be put. Under deregulation they will largely accrue to the oil companies and will generate either windfall profits or foreign oil exploration. While foreign oil exploration, if it takes place, will increase the supply of fuels and so help relieve the energy crisis, supply in this form presents two difficulties. It increases our reliance on *foreign* sources thereby potentially contraining our political independence in foreign affairs. Secondly, it increases our reliance on oil, a fuel which has substantially more adverse environmental impact than gas.

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[15] A rough computation is that with cost estimated by the FPC Staff to approximate 35 cents per Ccf, a 25-cent gap remains between cost and "value" in terms of low-sulfur fuel (as measured in the field).

The third alternative would direct these excess revenues either to the general public or to the development of new domestic sources of gas—either natural or manufactured. Assuming no additional supplies are to be forthcoming, distributing excess revenue to the general public is to be preferred to increasing the profits of the oil companies. If additional supplies are forthcoming, I feel that there is a legitimate public interest to be served in producing some part of those supplies in an environmentally sound and politically reliable fashion.

My legislative prescription theerfore would tend to favor the imposition of a tax of this nature, supplemented by a very simple amendment to the Natural Gas Act to accomplish the essence of the "contract sanctity" goal.

OTHER RECOMMENDATIONS

I would conclude with a summary of what does seem to be possible of accomplishment, aside from this particular area. My prescription would run to these items: (1) Improving FPC information-gathering,[16] as required if any regulation is to be effective, in at least these areas:

a. Full information as to the intrastate market including sources and uses of gas and price information, gathered on a regular basis.

b. Periodic cost reports to make the FPC's cost finding more effective and more current.

c. Differentiation between, at least, offshore and onshore costs and results.

d. Prompter and fuller reporting in respect to reserve reporting, including the "probable" as well as the "proven" category.

The FPC can probably accomplish this without legislation. (2) Improving the funding of R&D in respect to manufactured gas. (3) Improving Department of the Interior regulation in respect to offshore gas (which *may* need some legislation in respect to tract leasing[17] but is essentially dependent upon additional funding), so that the Department can enforce the present statute. (4) An R&D program administered by the Department which can be effective in evaluating the approximate size and location of offshore gas resources. (5) The vigorous negotiation of a concordat with Canada in respect to Arctic gas supplies. (6) The adoption of a Congressionally approved oil imports program which will not penalize those purchasing feedstocks for supplemental gas manufacture, and will in effect open the world market to those seeking these feedstocks. (7) The encouragement by distributors and pipelines to increase their gas exploration activities. The FPC is about to come to grips with this "vertical integration issue" and it should be given positive instruction in this direction. It is the distributors who by franchise have an obligation to make adequate gas supplies available to the market, and the pipelines who have a direct financial incentive to do so. In respect to those two possible sources of additional gas, regulatory action can be effective. For a fuller discussion of this area, I am attaching as Appendix C testimony offered in a recent proceeding (*Nomeco*) dealing with this matter more fully.

In concluding, I would like to thank the Subcommittee for this opportunity to advance these views and hope they may be of some value to it in its deliberations. Time has restricted assembling the documentation which I would like to have provided to support my conclusions. If your scheduling permits, I would like the opportunity of providing such documentation as hearing process indicates may be helpful.

STATEMENT OF QUALIFICATIONS OF CHARLES H. FRAZIER

My educational background consists of the completion of studies leading to an A.B. degree at Haverford College, 1924, and such studies as were required to receive the degree of Bachelor of Science in Electrical Engineering from the Harvard Engineering School in 1926.

The greater part of my working life was spent in the employ of the Philadelphia Gas Works, Division of the United Gas Improvement Company (now the UGI Corporation). I was employed by this company in 1939, initially as Manager of

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[16] The need for improved data-collection procedures under existing legislation is more crucial than ever in this shortage period. At present, the FPC relies almost entirely on industry-supplied A.G.A. proved reserves data as its basis for determining how much new gas is being found each year. Given the known and substantial lag in reporting these data, it is virtually impossible for the FPC to know whether a given price increase has or has not resulted in any overall supply improvement. Greater use of its existing data gathering authority could provide the FPC with a more up-to-date index of both proved *and* probable gas reserve findings.

[17] To avoid the burden which the present auction system imposes on the gas consumer, and improve the degree of access to this acreage.

Internal Auditing and retired in 1964. At the time of my retirement, as Director of Development, I had four principal areas of responsibility: rate policy, structure and administration; economic development, including supervision over the preparation of cost allocation studies, market analyses, and determination of policy with respect to new markets; system planning; and the procurement of natural gas and related matters, including participation with company's counsel in various formal and informal proceedings before the Fderal Power Commission. The latter responsibility included presenting the natural gas requirements of the Philadelphia Gas Works in various certificate proceedings before the Federal Power Commission, and participating, in its behalf, in numerous pipeline rate increase filings, assisting counsel in this respect and representing Philadelphia Gas Works in rate settlement conferences related thereto.

When the Commission began to exercise jurisdiction over the natural gas prices charged by independent producers, my responsibilities were expanded to cover producer rate matters. In this latter connection. I have given rate design testimony on behalf of the Philadelphia Gas Works and, in addition, a number of other Eastern distribution companies in individual producer rate proceedings involving the Tidewater, Continental, Sohio (Petroleum), Gulf, and Shell Oil companies. In the socalled CATCO proceeding, reopened on remand, I gave testimony with respect to the proper rate level to be used in conditioning the certificates sought by the applicant in those proceedings: and in proceedings concerning Bastian Bay sales to the United Gas Pipe Line Company, similar testimony was offered.

I also testified on behalf of the Philadelphia Gas Works, as well as several Eastern distribution companies, on the general subject of pipeline rates, in a case involving a 1963 rate increase filing by United Gas Pipe Line Company.

With the institution of the "area rate" methodology of producer regulation, in Docket Nos. AR61–1, *et al.*, known as the Permian Basin proceeding, I was asked to be the "Presiding Examiner's Witness," for the purpose of suggesting rate procedures designed to effectuate the Commission's newly announced area rate policy.

Later, since my retirement, I have testified on behalf of the Associated Gas Distributors (AGD), a group of some sixty gas distribution companies, in the Southern Louisiana Area Rate Proceedings, the Texas Gulf Coast Area Rate Proceeding, the Other Southwest Area Rate Proceeding as to field price rate design; and on behalf of Consolidated Gas Service Company in the Pipeline Production Area Rate Proceeding, on the same subject.

Also, on behalf of Philadelphia Gas Works, testimony was offered involving refund flow-through by the Texas Eastern Transmission Corporation, and with respect to rate of return in a 1969 rate proceeding of the same company; and with respect to the liberalized depreciation issue in a later Texas Eastern rate proceeding. I have recently appeared on behalf of a group of petrochemical companies in Docket Nos. CP72–47 and CP72–88, in connection with a certificate application of the Natural Gas Pipeline Company of America; and in Docket No. RP72–74 in a Southern Natural Gas Company curtailment proceeding for Atlanta Gas Light Company and Alabama Gas Corporation.

More recently, I have testified on behalf of Associated Gas Distributors (AGD) concerning pipeline certificate applications in Docket Nos. CP72–6, *et al.*, Tennessee Gas Pipeline Company proceeding. This testimony concerned the potential supply and requirements of gas distributors and the effect thereon of the proposed diversion of gas from the interstate pipeline market for use as refining fuel. Also on behalf of AGD, I have presented evidence in the matter of Belco Petroleum Corporation, Agent, *et al.*, Docket Nos. CI73–293, *et al.*, on rate design rationale. My presentation concerned several cost and non-cost factors which, in my opinion, the Commission should consider in making a decision in its just and reasonable rate findings in these proceedings at this time of "gas shortage." Also, I have introduced evidence on behalf of Atlanta Gas Light Company, regarding the standard rate structure proposed by Southern Natural Gas Company in their rate increase filing, Docket. No. RP 72–91.

During the past several years I have also appeared before various state commissions, i.e., the Massachusetts Department of Public Utilities on behalf of the Lowell Gas Company; before the Virginia State Corporation Commission and the North Carolina Utilities Commission on behalf of Virginia Electric and Power Company, relating to gas and electric increases filed by that company. I have appeared before the Pennsylvania Utility Commission in the 1969–1970 and the 1971–1972 Metropolitan Edison Company rate proceedings, and in the 1970 and 1972 Pennsylvania Electric Company rate proceedings; before the New Jersey Board of Public Utility Commissioners with respect to the rates of the New Jersey subsidiaries of the General Public Utilities Corporation; and before the New York Public Service Commission on behalf of Long Island Lighting Company in its electric undergrounding proceeding, and recent rate increase proceedings involving the electric and gas rates of this company. I have also appeared before the Public Service Commission of Maryland in connection with a rate increase application filed by Columbia Gas of Maryland.

In recent years I have served as a consultant for the gas agencies of various foreign governments; and have, on behalf of the Philadelphia Gas Works and others, participated extensively in economic studies and negotiations with respect to the importation of natural gas in liquefied form into the United States. In this connection I have offered testimony on behalf of the Atlanta Gas Light Company in the Columbia LNG Corporation proceedings and in the related Southern Natural Gas Company proceedings.

Finally, I have appeared before the Canadian National Energy Board, on behalf of Gaz Metropolitan, Inc., advancing a theory of rate design for Trans-Canada Pipe Lines Limited.

Appendix A

THE PROJECTED SUPPLY-DEMAND BALANCE FOR EASTERN GAS DISTRIBUTORS, 1973–1990

INTRODUCTION AND CONCLUSIONS

The Associated Gas Distributors, an informal grouping of some fifty eastern gas distributing companies, has recently completed an updated projection of the supply and demand for gas in their service area, the East Coast of the United States, looking primarily to the year 1980, but with a further projection to 1990. The original study was published in September 1972. It undertook this work because the projections available to it from other public sources were deficient in not portraying, in any realistic way, the problem which actually is likely to confront it and its member companies. First, most projections have been on a national basis, with little specific attention to regions. Second, the requirements, that is the demand aspect of the equation, have been very considerably overstated, in the light of the circumstances which are likely to prevail—an element to be later discussed.[1] Finally, little has bee done to consolidate reasonable estimates of future supply, both from the traditional areas of natural gas supply and from the various supplemental sources on which the gas industry will increasingly have to reply.

The conclusions of this review are that a virtually constant, and then modestly growing, projection of requirements will be juxtaposed against a diminishing East Coast share of domestic production, itself declining, with the result that the deficiency between the East Coast requirements and this share will increase year by year. It is estimated that by 1980 this deficiency will amount to 42 percent of the East Coast requirements of that year, and that this percentage will increase by 1990 to 62 percent.

This does not mean, however, that these requirements cannot be met. The Federal Power Commission staff has estimated that by 1980 two billion one hundred million Mcf annually may be imported in the form of LNG, of which the East Coast share should be at least 700 million Mcf (or 2 million Mcf a day). Furthermore, these figures may double during the suceeding decade. None of these figures envisage such proposals as the bringing in of Siberian gas or similar projects which have been the subject of recent feature stories.

The supplemental gas required to balance East Coast supply and demand (some two million Mcf a day in 1980) must presently be considered as being produced from crude oil or its derivatives. If this is to be the supplemental source, plants producing 700 million Mcf a year must be in being by 1980 (with a likely increase of another 50 percent or more by 1990). This represents the equivalent of eight major plants of the size currently being contemplated, which are being designed to produce 250,000 Mcf a day (now considered to be the optimum size plant). This is a goal which requires prompt and effective effort on the part of the gas distributing companies (and the pipeline companies), but is certainly not beyond capability of the industry. Over half this target is on the drawing boards today, and several projects are actually under construction.

The general conclusion of the group is that reasonable growth in gas sales and territories can be attained. It is true that costs will be higher, but not at levels that will cause the gas industry to be less than actively competitive. In order to achieve this reasonable growth it is necessary that the industry vigorously pursue its goal of developing the required supplemental sources and that all government agencies cooperate in the attainment of this objective. The tables and chart which follow illustrate the magnitude of the problem.

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[1] Cf. page 12 for the definition of "requirements" which has been used herein.

FORECAST BALANCE BETWEEN EASTERN STATES[1] ADJUSTED GAS REQUIREMENTS THROUGH 1990 AND EASTERN STATES SHARE OF DOMESTIC PRODUCTION BASED ON CONSERVATIVE NATIONAL RESERVE ADDITIONS AND A DECLINING SHARE OF INDIGENOUS GAS SUPPLIES TO THE EASTERN STATES

[Volumes in trillions of cubic feet at 14.73 lb/in²a and 1,000 Btu per cubic foot]

Year	Adjusted requirements[2] (1)	Eastern States share of domestic production[3] (2)	Balance to be met from supplemental sources: Volume (1)−(2) (3)	Balance to be met from supplemental sources: Percent of adjusted requirements (3)÷(1) (4)
1973	2.94	2.80	0.14	5
1974	2.91	2.62	.29	10
1975	2.92	2.46	[4].46	16
1976	2.94	2.30	.64	22
1977	2.96	2.18	.78	26
1978	3.06	2.06	1.00	33
1979	3.15	1.97	1.18	38
1980	3.26	[5]1.89	[4]1.37	42
1985	3.83	1.80	[4]2.03	53
1990	4.53	1.74	[4]2.79	62

[1] New England, the eastern portions of New York and Pennsylvania, New Jersey, Delaware, Maryland, District of Columbia, Virginia, North Carolina, South Carolina, Georgia, and Alabama.

[2] Adjusted per NERA workpapers, and excluding FRC field use volumes. (See p. 5.)

[3] Calculated with conservative reserve additions and with the Eastern States receiving a declining share of the national domestic supply (from 14.22 percent in 1970 to 10.66 percent in 1980, and continuing at that level).

[4] For 1975, the bulk of supplemental supply would be SNG. In 1980, SNG and LNG would provide approximately equal quantities, and we see LNG increasing more rapidly thereafter.

[5] With the Eastern States maintaining a constant share of domestic production, this figure would be 2.52 T ft³. The shortage would then be 0.74 T ft³.

Source: Col. (1): P. 5, col. (7). Col. (2): Appendix table I, col. (5) multiplied by the Eastern States' declining share percentages.

EASTERN STATES[1] ADJUSTED[2] GAS REQUIREMENTS

[Volumes in trillions of cubic feet at 14.73 lb/in²a and 1,000 Btu per cubic foot]

Year	Firm: Residential (1)	Firm: Commercial (2)	Firm: Industrial (3)	Electric utilities (4)	Interruptible industrial (5)	Other[3] (6)	Total (7)
1973	1.04	0.40	0.56	0.29	0.49	0.16	2.94
1974	1.05	.41	.57	.26	.46	.16	2.19
1975	1.07	.42	.59	.24	.44	.16	2.92
1976	1.09	.43	.60	.23	.43	.16	2.94
1977	1.11	.45	.61	.21	.42	.16	2.96
1978	1.15	.47	.64	.21	.42	.17	3.06
1979	1.19	.50	.66	.21	.42	.17	3.15
1980	1.23	.53	.69	.21	.42	.18	3.26
1985	1.45	.69	.85	.21	.42	.21	3.83
1990	1.71	.99	1.05	.21	.42	.25	4.53

[1] New England, the eastern portions of New York and Pennsylvania, New Jersey, Delaware, Maryland, District of Columbia, Virginia, North Carolina, South Carolina, Georgia, and Alabama.

[2] Firm requirements at ½ the FRC operational estimate growth rates through 1977, at full FRC growth rates thereafter; electric utilities at twice the rate of decline of national interruptible electric through 1977, frozen thereafter; interruptible industrial at ½ the decline of electric utilities through 1977, frozen thereafter; other at the composite growth rate of all other classes:

Annual growth rates:

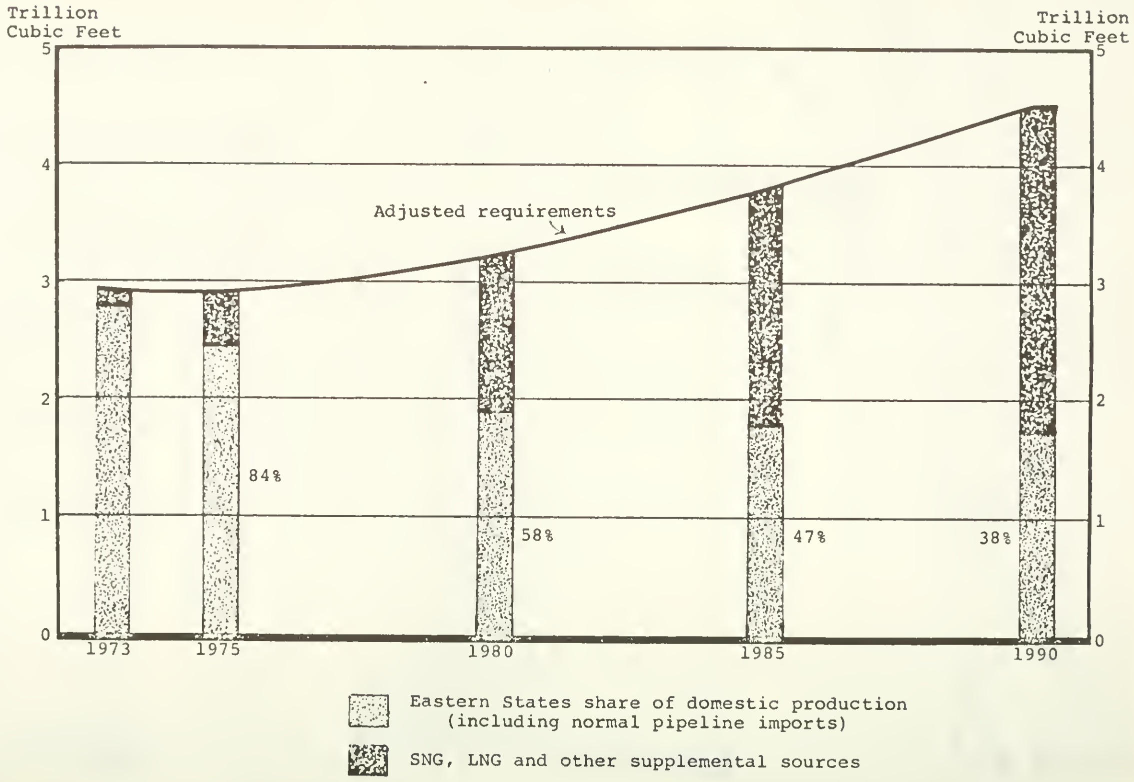
Residential	3.40
Commercial	5.40
Industrial	4.30
Other	Composite

Electric—2 times rate of decline of col. (5), table II.
Interruptible—½ times col. (4) decline.

[3] Includes company usage and unaccounted for losses, transmission mainline fuel, and any other use not otherwise classified.

Source: By extrapolation from estimated 1972 consumption, using the method explained in footnote 2. For sources of growth rates, refer to table II source note.

FORECAST BALANCE BETWEEN EASTERN STATES ADJUSTED GAS REQUIREMENTS THROUGH 1990
AND EASTERN STATES SHARE OF DOMESTIC PRODUCTION PLUS POTENTIAL SUPPLEMENTAL SOURCES



THE OUTLOOK FOR THE SUPPLY OF DOMESTIC NATURAL GAS

To determine supply for the East Coast it is first necessary to make projections as to the supply which may be available from the "lower 48" states. For this purpose we have utilized the most recent report of the Federal Power Commission staff, issued in February 1972. We find that this report is consistent with the potential supply as found by the Potential Gas Committee in its most recent report issued in October 1971.

A word needs to be said as to "potential supply." The projections of the Potential Gas Committee are more conservative than the data recently made public by the Department of the Interior in Geological Survey Circular 650.[2] However, a careful reading of this Circular, and the methods by which the estimates were prepared, would indicate that the estimates of the Potential Gas Committee represent a more suitable basis for investment decisions.

The Circular 650 estimates have a number of serious weaknesses for use in a projection of supply to serve as a guide to the gas industry for use in planning. They have no limitation as to technology, going well beyond proven technology in estimating available resources, and it may be presumed that much of the computed resource would only come in at costs far beyond any concept of gas value. They extend, geographically, further offshore than the presently contemplated limit (600 feet of water depth[3]) and to Alaska. Finally, they are basically estimates of oil to be found, converted to gas potential via an historical ratio, which may or may not apply to future discoveries. Thus, while the Circular's message is at first blush encouraging, we conclude that the Potential Gas Committee's findings are more suitable for gas industry planning and investment purposes.

To support the projection of production levels for the next two decades, reserve additions of some 400 billion Mcf will need to be made during this period, a figure only modestly less than the sum of the categories of "probable" and "possible" reserves enumerated by the Potential Gas Committee. This leaves unutilized the category of "speculative" reserves for development subsequent to the next decade or so. It seemed only prudent, in planning for future service to the gas industry's customers, that the speculative potential be largely discounted for intermediate-range forecasts as to gas availability.

In the above consideration the price of gas at the wellhead has not been specified. It is assumed, first, that this price will be adequate as an incentive to a reasonable level of exploration (considerably higher than that in the recent past). On the other hand, it is not assumed that a ballooning price of gas will cause a major change in the rate of reserve additions, since, in the light of what we can count on to the potential supply, this would only accelerate the early rundown of domestic reserves to a potentially seriously low level.

Consequently, the projections may be said to be reasonably conservative, attainable at reasonable prices, which may be bettered somewhat, but not out of scale, if conditions of exploration and development turn out to be much more favorable. These national projections are tabulated in the attached appendix.

THE CORRESPONDING PRODUCTION LEVELS

To determine the domestic *production* which a given level of reserve additions will support, we have used a declining Reserves-to-Production ratio, down to a minimum of ten, which would be reached in 1974. At the relatively conservative rate of reserve additions we have posited, and taking account of field use volumes, we estimate a peak production, available to consumers nationally, of 21 trillion cubic feet in 1973.[4] declining thereafter. Thus, the "shortage," in terms of domestic supply, is with us "for the duration" and will become more severe time as goes on.

It should be noted that in this method of forecasting production, there has been a netting process, by which the relatively rapid decline of the older reserves has been off-set by reserves currently being found, as on the 1970 lease sale acreage. Consequently, the validity of the projection depends importantly on a positive leasing policy on the part of the Department of the Interior, as well as on active onshore exploration in the deeper horizons.

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[2] U.S. Department of the Interior, *Energy Resources of the United States*, 1972.

[3] The Potential Gas Committee includes a minor increment (38 trillion cubic feet), largely speculative, as discoverable between 600 feet and 1,500 feet.

[4] Since the corresponding figure for 1972 was also calculated at 21 trillion cubic feet, it appears that the historical peak is at hand.

For our projections into the future we would have preferred using comprehensive forecasts from our supplier pipelines, but these were not available. Failing this, and starting with the figure of 14.2 percent as the recent basic share of national production available to the East, we deemed it only prudent to assume that this percentage share would fall off. The *past* share of this national production which has been available to the Eastern States has been determined with reasonable accuracy. In an appendix we show our derivation of this share for the years 1968 to 1970. It reached its peak in 1969 and declined slightly in 1970, with evidence that the figure of about 14 percent (actually 14.2 percent) held relatively constant in 1971, but declined in 1972.

As the unregulated *intrastate* demand mounts,[5] it is in a superior position to siphon off a larger and larger proportion of the national total. We can expect resistance to this process, but not its reversal. It seemed wise, therefore to taper off the historic proportion by some 25 percent by the year 1980, so that the East would by then only be receiving 10.7 percent of the national total. We assume that this lower East Coast fraction (percentage share) could be held constant thereafter, keeping in mind its better-than-average position with respect to Atlantic offshore resources, the superior position of the Middle West with respect to supplemental supplies, and the likelihood that the situation will stabilize once there is full knowledge of the permanent nature of the gas supply-demand imbalance.

The conclusion to be drawn from these various computations is that the East Coast share of indigenous production will decline steadily from this point forward, from approximately 2.8 trillion cubic feet in 1973 to 1.9 trillion in 1980 and 1.7 trillion in 1990. This means that merely to stand still in the 1970s the East would have to find supplemental sources of gas of nearly *two and one-half million Mcf per day*, and to grow in the modest degree we project, another million Mcf per dal, a total of three and one-half to four million Mcf per day for the 1970s, a formidable task.

The chart on page 6 serves to illustrate graphically the likely supply-demand balance.

To sum up, we conclude that by 1975, before major LNG increments may be expected, the shortages, of nearly a million Mcf a day, will have to be met by SNG. By 1980, we would look for the shortage to be met in approximately even quantities from LNG and SNG, with the former increasing somewhat more rapidly thereafter. As above noted, we would look for a reasonable balance to be attainable in those latter years—at a cost.

THE PROJECTION OF EAST COAST GAS REQUIREMENTS

Before describing the methodology used in deriving "requirements," a word should be said with respect to what we consider the most useful approach to this concept. Thus, it is meaningless to add up all the fuel needs of the area, even though this is one measure of requirements, as being impossible of achievement; or even to project forward the trends of the 1960s. Rather, we chose to define "requirements" as the amount of gas which is needed for sale at growth rates which are reasonably attainable at prices likely to prevail; and in the category of boiler fuel and similar industrial usage, in volumes which will recognize the need to reprice the sales for such purposes in a manner which gives recognition to the incremental cost of the supplementary gases which would be needed to meet this demand. If we may think of this price as being a dollar or more, it is obvious that growth in these categories may be even more severely limited.

We conclude that the most reliable basic source of data on requirements was the Future Requirements Committee; but that since its most recent formal measurements of requirements were based on *full* supplies of natural gas at *current* price relationships, and neither of these conditions is likely to prevail, its operational[6] five-year forecast was considered to be the most realistic base on which to make projections. However, even these modest projections do not reflect the unfavorable trends of the last three years; and the likelihood that *at best*, we won't see a "turn around" for a like period of time or even a year or two longer.

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[5] See also footnote 7, page 13.

[6] The Future Requirements Committee is the accepted industry source for requirements forecasts, relied on as well by the Federal Power Commission. It publishes forecasts annually, but the most recent one contained two forecasts—the one assuming no gas shortage, and the other, the "operational" forecast, a more realistic estimate of what would actually be sold.

We have recognized reality in three ways. First, we held the industrial growth rate (most important in the Southwest) to 1 percent for firm sales for the next five years. Second, we recognized the current policy[7] trend to place sales for electric generation in a relatively low priority position, and used the most recent "official" government projection for such use,[8] which shows a gradually declining trend. We held the *firm* use constant, and took the decline in the interruptible use. Third, we used the same declining rate of sales in the interruptible industrial category which we derived for interruptible sales to electric plants. These sales provide the balance wheel for the industry, taking place largely in the warmer months where capacity is idle. However, they also serve as a balancing factor during periods of shortage, since they are, as the title implies, subordinate to other needs.

While this set of forecasts seemed to be a reasonable one to use for the national balance, we considered it did not, for eastern regional purposes, sufficiently discount the pipeline curtailments of 1972 and the next few years. To reflect this further element of stringency, the Eastern States' growth rates were cut in half for the next five years; it being the view that the construction of SNG facilities will permit a reasonable, if modest, growth rate by 1978. Also the "electric interruptible" category was decreased by twice the national rate of decline for such sales through 1977, and then held constant thereafter (because of the potential need to purchase expensive supplemental supplies on a high load factor basis).

STEPS NEEDED TO ACHIEVE A BALANCE

As noted, to reach a balance between modestly growing requirements and overall supply, the deficiency of 1.4 billion Mcf per year in 1980, doubling by 1990 (and on a national basis 6.5 billion Mcf and 13.8 billion Mcf, respectively), must be met from various supplemental sources, to be discussed below in greater detail.

Gas From Oil.—The most immediate source of supplemental gas will be from plants which manufacture pipeline quality gas from oil and its various derivatives (naphtha, natural gas liquids and LPG's). The technology is adequate, assuming scale problems can be met, for the manufacture of gas from the lighter petroleum derivatives. The Administration seems at last to be adjusting the oil imports programs to facilitate this goal, though it has a way to go.

Because of problems of national security, it would be desirable to extend the armory of weapons for the manufacture of gas to processes deriving gas from heavier fractions including crude oil, the importation of which does not subject the East Coast to as many hazards. It may reasonably be expected that during the next few years the technology for this will also be developed.

We expect the gas industry to build these plants either individually or in concert with pipelines, thus providing the most immediate means of lifting the restrictions on gas growth. *LNG*—The next source which may become available in any quantity, chronologically, is LNG. The present impasse appears to be being dissolved, and it is reasonable to expect that some of the gas in North Africa and in the Caribbean will be imported to the East Coast (other gas supplies being imported to the Gulf Coast and West Coast). The rather modest 1980 target only calls for the two to three currently filed projects being successful.[9] This projection may turn out to be pessimistic, but in view of the world demand for fuel we cannot reasonably expect that the United States will be able to attach a much more substantial quantity of the presently known reserves.

The Atlantic Shelf.—Specific mention should be made of the Atlantic Shelf potential. It has not been included in our supply forecasts, as to speculative at this time. However, there *is* a potential there, and it is, of course, especially important to the eastern area. East Coast gas companies can be expected to be of what assistance they can to further the exploratory work, once legal hurdles have been overcome. The Potential Supply Committee assigns a "speculative" potential of 35 trillion cubic feet to this area—a ten-year supply.

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[7] It must be realized that the FPC priorities apply only to sales over which it has jurisdiction. A large proportion of industrial sales and sales to power plants are beyond its reach. For these and other reasons, these priorities will have only a limited effect on national sales in these categories.

[8] U.S. Department of the Interior, *United States Energy Through The Year 2000*, December 1972.

[9] Caveat: Reaction to the LNG storage tank incident in Staten Island may cause strong legal actions aimed against any project bringing LNG into Eastern seaports.

Arctic Gas.—It is a virtual certainty that Arctic gas reserves on the order of 100 billion Mcf will be proven in the next several years, with geologists predicting that the ultimate reserve figures will be considerably higher. If the first large pipeline is completed by 1980 to bring in, let us say, 5 to 6 million Mcf per day (56-inch pipe is being talked about) from the Mackenzie River Delta and the Prudhoe Bay region, a target of some 2 billion Mcf per year could be achieved. Reserves of 100 billion Mcf would, of course, support a much larger figure. The following decade should more than double the 1980 target. Along with gas from coal, this is the most promising supplemental source in terms of its ultimate potential.

The East Coast, however, is not in a particularly favorable position, geographically, to benefit by these importations though it may do so to some extent by displacement if there is a formal, or even a de facto, national allocations policy. The one exception which should be mentioned is the potential of a line from the Arctic Islands which could be built north of the Hudson Bay to reach Montreal and from there the Northeastern United States. Because of the difficult pipelining problems, and the remoteness of the gas, this project would appear to be a decade away, and not one on which the East Coast can count in its intermediate term planning.

While we note the "Arctic gas" supplemental source as being of great significance, we must recognize that the arrangements with the Canadian government are a long way from being worked out, and progress is not *visible*. Nevertheless, the potential is there, the investment program well launched, and it is reasonable to expect an accommodation with Canada will be worked out of advantage both to that country, economically, and the U.S.

Gas From Coal.—In terms of United States' resources, pipeline gas from coal is the most substantial of the supplemental resources on which we should count. We may reasonably expect that the technology will be available in three to four years for a relatively economical conversion of coal into gas, and that commercial plants will start being built in the latter part of this decade. It is reasonable to project that nationally (as the FPC has done) this will be a consistently growing source of domestic gas. However, we do not believe that the location of coal reserves available for this purpose is such that it should be considered, from an East Coast standpoint, as a substantial source. Most of the potential low-cost reserves are west of the Mississippi.

CONCLUSION ON SUPPLEMENTARY SOURCES

Both nationally and on the East Coast, the various potential supplemental sources above described can add up to a total supply which will meet the shortage forecast for indigenous natural gas production. The important thing to keep in mind is that no single one of these potential sources can be overlooked—they are not alternatives but part of the composite whole. All must be pursued by the gas industry with vigor and expedition. The gas distributing companies have an important role in this respect.

APPENDIX TO EASTERN STATES GAS SUPPLY-DEMAND STUDY

Explanatory

The material contained in this appendix sets forth the results of the studies performed in order to prepare the Eastern States supply-demand balance contained in the text of this report as well as to illustrate the manner in which the assumptions discussed in the text were derived.

TABLE I.—FORECAST BALANCE BETWEEN UNITED STATES[1] ADJUSTED GAS REQUIREMENTS THROUGH 1990 AND ESTIMATED SUPPLIES OF GAS FROM DOMESTIC PRODUCTION AND SUPPLEMENTAL SOURCES BASED ON CONSERVATIVE DOMESTIC RESERVE ADDITIONS

[Volumes in trillions of cubic feet at 14.73 lb/in.² and 1,000 Btu per cubic foot]

Year	Adjusted requirements[2] (1)	Domestic production and reserves					R/P ratio (6) divided by (5) (7)	Requirements not met by domestic production (1) minus (5) (8)	Pipeline net imports from established sources (9)	Balance to be met	
		Reserve additions[3] (2)	Domestic production (3)	Field use (4)	Available to consumers (3) minus (4) (5)	Remaining proved reserves (6)				Volumes (8) minus (9) (10)	Percent of adjusted requirements (10) divided by (1) (11)
1972			[4] 23.1			[4] 242.2					
1973	22.3	12.0	22.9	2.0	20.9	231.3	10.1	1.4	1.0	0.4	2
1974	22.4	13.0	22.2	2.0	20.2	222.1	10.0	2.2	1.1	1.1	5
1975	22.4	14.0	21.5	1.9	19.6	214.6	10.0	2.8	1.1	[5] 1.7	8
1976	22.6	14.6	20.8	1.9	18.9	208.4	10.0	3.7	1.1	2.6	12
1977	22.8	15.2	20.3	1.8	18.5	203.3	10.0	4.3	1.2	3.1	14
1978	23.3	15.8	19.9	1.8	18.1	199.2	10.0	5.2	1.2	4.0	17
1979	23.7	16.4	19.6	1.7	17.9	196.6	10.0	5.8	1.3	4.5	19
1980	24.2	17.0	19.4	1.7	17.7	193.6	10.0	6.5	1.3	[5] 5.2	21
1985	27.1	17.0	18.5	1.6	16.9	184.6	10.0	10.2	1.6	[5] 8.6	32
1990	30.1	17.0	17.9	1.6	16.3	179.1	10.0	13.8	1.4	[5] 12.4	41

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[1] Contigous 48 States.

[2] Adjusted; excludes FRC field use volumes.

[3] Includes increase in underground storage.

[4] American Gas Association, "AGA News," Mar. 19, 1973, table I, with Alaskan volumes deleted, and converted to 1,000 Btu per cubic foot.

[5] In the early years the bulk of the supplemental supply will be from SNG, with LNG becoming significant by 1977. By 1980, gas from the Artic, including Alaska, could make up half the deficit, with the bulk of the balance divided between SNG and LNG in relatively equal quantities. Minor coal-derived supplies will be received, Roughly the same proportions would be maintained thereafter with, however, gas from liquids growing less rapidly, and gas from coal increasing more rapidly.

Source: Col. (1): Appendix table II, col. (8). Col. (2) & (9): Federal Power Commission, Bureau of Natural Gas, "Natural Gas Supply and Demand, 1971–90," February 1972, pp. 3 and 55, case II, respectively. Col. (3): From 1974 through 1990, calculated production necessary to maintain R/P ratio at 10:1. Col. (4): Calculated by taking lower 48 field use (as developed by FPC in its supply-demand report, p. 150) as a percentage of AGA production in 1970, and applying this percentage (8.9 percent) to the 1971–90 volumes in col. (3). Col. (6): For each year, remaining reserves are calculated by taking the previous year's reserves less the current production plus the current reserve additions.

TABLE II.—UNITED STATES[1] ADJUSTED[2] GAS REQUIREMENTS

[Volumes in trillions of cubic feet at 14.73 lb/in²a and 1,000 Btu per cubic feet]

Year	Firm			Electric utilities		Interruptible industrial	Other[3]	Total
	Residential	Commercial	Industrial	Firm	Interruptible			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1973	5.33	2.23	6.29	2.25	1.76	3.01	1.44	22.31
1974	5.47	2.32	6.34	2.25	1.67	2.87	1.45	22.37
1975	5.62	2.40	6.40	2.25	1.59	2.73	1.45	22.44
1976	5.77	2.49	6.44	2.25	1.55	2.66	1.46	22.62
1977	5.93	2.59	6.49	2.25	1.51	2.59	1.48	22.84
1978	6.11	2.70	6.71	2.25	1.47	2.52	1.51	23.27
1979	6.30	2.82	6.95	2.25	1.43	2.45	1.54	23.74
1980	6.50	2.94	7.19	2.25	1.39	2.38	1.57	24.22
1985	7.57	3.63	8.52	2.25	1.23	2.12	1.75	27.07
1990	8.82	4.48	10.10	2.25	.93	1.60	1.95	30.13

[1] Contiguous 48 States.

[2] Residential and commercial at FRC operational estimate growth rates; firm industrial at 1.00 percent per annum (Southwest producing States at ½ growth, rest of country at zero growth) through 1977, at FRC operational estimate growth rate thereafter; electric utilities at the USDI rates, with all of decline allocated to interruptible use; interruptible industrial at same rates of decline as electric interruptible; other at the composite growth rate of all other classes. 1973 through 1977 firm requirements have been reduced by amounts equivalent to reductions in Eastern States firm requirements. See p. 5, footnote 2:

	Percent
Annual growth rates:	
Residential	3.10
Commercial	4.30
Industrial	3.46
Interruptible, same as col. (5) decline.	
Other	Composite
Electric:	
1971–75	2.07
1975–80	1.09
1980–85	.85
1985–90	1.80

[3] Includes company usage and unaccounted for losses, transmission mainline fuel, and any other use not otherwise classified.

Source: By extrapolation from estimated 1972 consumption, based on growth rates from Future Requirements Committee, "Future Gas Requirements of the United States," volume No. 4, October 1971, and U.S. Department of the Interior, "United States Energy Through the Year 2000," December 1972.

TABLE III.—DERIVATION OF EASTERN STATES SHARE OF NATIONAL GAS SUPPLY

[Volumes in billions of cubic feet at 14.73 lb/in² a and 1,000 Btu per cubic foot]

Description	1968	1969	1970
(1)	(2)	(3)	(4)
Total U.S. available supply[1]	18,092	19,305	20,515
Eastern States natural gas consumption[2]	2,554	2,778	2,917
Percentage of total U.S. available supply consumed in the Eastern States	14.1	14.4	[3] 14.2

[1] Natural gas available to consumers including pipeline fuel for the contiguous 48 States.

[2] Natural gas delivered to consumers plus pipeline fuel in New England, the eastern portions of New York and Pennsylvania, New Jersey, Delaware, Maryland, District of Columbia, Virginia, North Carolina, South Carolina, Georgia, and Alabama.

[3] All of the data with which to make comparable calculations for more recent years are not available. However, there is evidence that the 1971 percentage remained relatively constant; while the 1972 percentage declined due to curtailments in the East (about a 0.6-percent decrease in deliveries compared to 1971) and a 2.2-percent increase in U.S. domestic production.

Source: Line 1: AGA net production (excluding Alaska) less lower 48 field use as computed in Federal Power Commission, "National Gas Supply And Demand, 1971–90," February 1972, p. 150. Line 2: Bureau of Mines, "Minerals Yearbook," delivered to consumers plus pipeline fuel, adjusted for a 2 percent sampling error, a 3.2-percent Btu differential, and a 2-percent differential related to supplemental sources of supply other than pipeline imports.

ASSOCIATED GAS DISTRIBUTORS

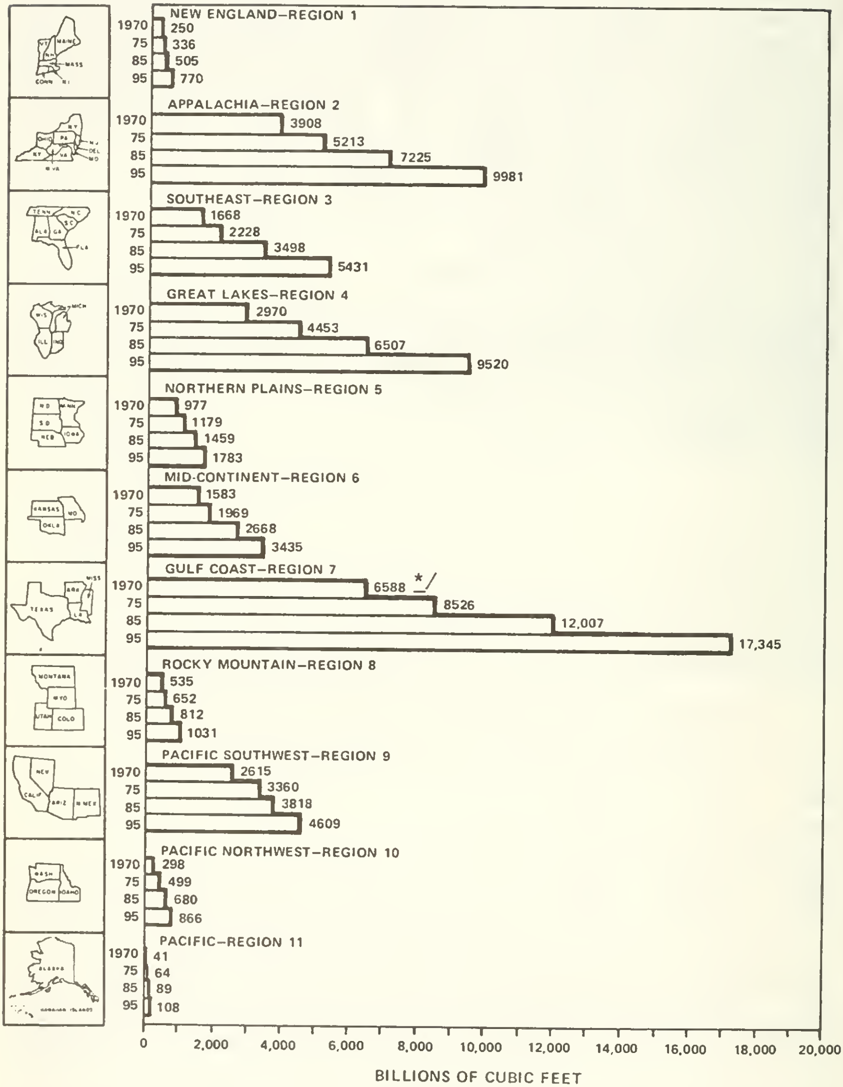
Atlanta Gas Light Company.

The Berkshire Gas Company, Boston Gas Company, Bristol and Warren Gas Company, Brockton Taunton Gas Company, Cape Cod Gas Company, Commonwealth Gas Company, City of Holyoke, Massachusetts Gas and Electric De-

partment, City of Westfield Gas and Electric Light Department, Concord Natural Gas Corporation, The Connecticut Gas Company, Connecticut Natural Gas Corporation, Fall River Gas Company, Fitchburg Gas and Electric Light Company, Gas Service, Inc., The Greenwich Gas Company, The Hartford Electric Light Company, Haverhill Gas Company, Lawrence Gas Company, Lowell Gas Company, Lynn Gas Company, Manchester Gas Company, Mystic Valley Gas Company, New Bedford Gas and Edison Light Company, The Newport Gas Light Company, Northampton Gas Light Company, North Attleboro Gas Company, Northern Utilities, Inc., North Shore Gas Company, The Pequot Gas Company, Providence Gas Company, South County Gas Company, Southern Connecticut Gas Company, Springfield Gas Light Company and Tiverton Gas Company (jointly).
The Brooklyn Union Gas Company.
Central Hudson Gas and Electric Corporation.
Consolidated Edison Company of New York, Inc.
Elizabethtown Gas Company.
Long Island Lighting Company.
New Jersey Natural Gas Company.
North Carolina Natural Gas Corporation.
Philadelphia Electric Company.
Philadelphia Gas Works.
Piedmont Natural Gas Company, Inc.
Public Service Company of North Carolina.
Public Service Electric and Gas Company.
Rochester Gas and Electric Corporation.
UGI Corporation.
Washington Gas Light Company.

APPENDIX B

FUTURE U.S. GAS REQUIREMENTS BY REGION, 1970, 1975, 1985, and 1995



*/ 23.5 percent of this amount is used by electric utilities and 59.4 percent by industrial users.

Source: Future Requirements Committee, Future Gas Requirements of the United States, Volume No. 4, October 1971, p. 29.

Appendix C

FEDERAL POWER COMMISSION

In the Matter of
Northern Michigan Exploration Company, *et al.* Docket Nos. CI72–301, *et al.*

PREPARED TESTIMONY OF CHARLES H. FRAZIER

Q. Will you please state your name, address and qualifications?

A. My name is Charles H. Frazier and my address is Downingtown, R.D. 2, Pennsylvania. I am an independent public utility consultant with offices in Philadelphia, associated with National Economic Research Associates, Inc. since 1964. A further statement of my qualifications is appended hereto (Appendix A).

Q. For what purpose are you presenting testimony in this proceeding?

A. I have been asked by Associated Gas Distributors (AGD) to present testimony bearing on the questions raised by the Federal Power Commission in its Order of March 20, 1973 remanding this proceeding to the Administrative Law Judge for further findings on the "vertical integration" issue. In the Order which he entered on October 5, 1972, the Administrative Law Judge issued his decision (favorable to the applicant) solely on the basis of the facts in the case before him, finding there was not "hard"evidence before him sufficient to support a conclusion that the alleged adverse longer term consequences of distributor ventures into exploration for new natural gas supplies outweighed the obvious advantages of the project. It is to attempt to fill that perceived gap that AGD is offering this testimony.

Q. What are the issues to which you refer?

A. I think the simplest way of answering that question is to quote here, for easy reference, the key paragraph in the March 20, 1973 Order (Docket No. CI72–301, *et al.*). It is as follows:

> Before turning to the merits of the Central Illinois appeal, we think it important for us to indicate what we mean by the "vertical integration question." That phrase should not be translated for the purposes of this case to refer to antitrust issues only. Antitrust issues are clearly comprehended by it, but so also are a considerable number of other public policy issues: e.g., (1) the effects upon the production segment of the gas industry arising from the entry of distributors, (2) the preemption of pipeline capacity by distributors, (3) the applicability of pipeline curtailment plans to distributor-acquired and distributor-transported gas, (4) the ability of pipelines to serve all customers, and to function, in effect, as common carriers, (5) consequences upon small distributors and their ability to serve their customers, (6) the effects upon competition at each industry segment, e.g. production, transmission, and distribution, and the overall public interest, and (7) the reservation of gas for a distributor's own use and the sale of gas by a distributor to a pipeline. These above-enumerated policy issues are in no way all-inclusive, but are merely illustrative of some of the issues which seem to us to require attention. We use the phrase "vertical integration question" here as a convenient shorthand, but the phrase should be understood to embrace all of the broad implications which we have ascribed to it.

Q. Why is there concern among the distributors by whom you are retained that the issue characterized by the Commission as "vertical integration" not be the basis for a decision here which might broadly proscribe exploration activity?

A. The basic issue should be considered in the light of the following circumstances. Distributors have a franchise obligation to furnish adequate gas service in their service areas at appropriate rates. To discharge that obligation, they have, over the past century or more, provided service in an essentially *integrated* fashion; that is to say the distributor typically purchased the raw materials, converted them into gas, and distributed and sold the product to its customers. In the middle decades of this century, this general principle was departed from, to an important extent, because most companies found it cheaper to purchase natural gas than to make gas themselves; and since it was cheaper, it was to the advantage of its customers either to abandon or deactivate the gas manufacturing plants in favor of the less expensive fuel source (natural gas). This change, however, never absolved the distributor of his obligation [1] to provide the total service; and, in many cases, if only for peaking purposes, he continued to provide some fraction of the gas supply required.

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[1] Note his is the only entity in the chain which has that obligation—unshared with either pipeline or oil company producer.

Now the situation is changing to a major extent. Natural gas is becoming more expensive; but equally important to these distributors, it apparently will not be available in sufficient quantity to meet the requirements of their customers—some curtailment is currently being experienced. Nor do they currently foresee the scale of activity of the oil companies—and to a lesser extent the pipelines—as being adequate to meet these growing requirements.[2] Under these circumstances distributors have moved, in a variety of directions, to fill the gap which is beginning to widen between their customers' requirements and the available supply of natural gas, to discharge their above-mentioned responsibility to their service area. The gas distribution industry is thus in the process of returning, full circle to its posture of full responsibility for performing all the service functions inherent in rendering gas service.

In sum, vertical integration has traditionally been an essential characteristic of the gas industry, and the mere fact that in the 1950s and 1960s the distributors relinquished a part of the field of service constitutes no reason, at this point in time, to consider that their moving back into it is anything other than a natural, responsible action, consistent with the historical structure of the industry.

Q. What steps have distributors taken to meet the gap about which you have just testified?

A. They have taken a number of steps which, depending on the size of the company, either extend through the whole gamut of alternative sources of supply, below listed, or may involve only one or two of them. Only the very large companies, of course, can afford the whole sweep of the effort on an independent basis while other companies may rely on cooperative efforts. These efforts include the purchase of LNG; the construction of synthetic gas plant (a modern version of the old manufactured gas plant), using petroleum products or coal; the upgrading of summer interruptible sales into storage by means of LNG storage and other storage facilities; the extensive use of LPG's for peak-shaving; and, as in the instant case, the actual expenditure of the company's capital for the exploration and development of additional natural gas reserves. These conditions have also involved (a) encouragement to supplier pipelines to make advance payments to purchasers and to pipeline affiliates for E&D activities and (b) the payment of higher field prices to stimulate additional producer exploration. Both of these cannot, of course, be considered to be the equivalent of, or the replacement for, direct distributor action.

Q. Are there other alternatives which distributors have considered to meet the supply gap?

A. When it became apparent that, for whatever reason, insufficient exploration and development effort was forthcoming to "fill the pipelines" again, certain distributors on the Eastern Seaboard in addition to individual E&D efforts determined that through cooperative distributor action, on a pipeline-by-pipeline basis, additional effort in the exploration and development field could also be forthcoming and be effective. This cooperative action is important for some companies which have determined that individual exploration activity is not within their capability. One such cooperative proposal (discussed below) which involves an E&D rate supplement to be included in the pipeline tariff is now before the FPC.

Q. Why did these distributors conclude it was *their* responsibility, in contrast to the traditional producers, the major oil companies, and the pipelines, to take this initiative?

A. The rationale for their entering into this field of activity may be summed up as follows: (1) *gas price* has serious frailties as a lever to enhance the exploration activities of the major oil companies whose primary interest is in the discovery of oil, worldwide; (2) with the present regulatory arrangements, it is only if distributors (or pipelines) explore *onshore* that the *interstate* market will get its share of new *onshore* gas reserves; and (3) pipeline exploration efforts are rather clearly not filling the gap.

Q. Will you please elaborate?

A. The problem with gas price as a lever is as follows: the major oil companies' basic interest is still in finding liquids, and, by and large, the shape and size of their exploration program will be determined by oil considerations.[3] It is no fluke that a larger and larger share of their exploration dollar is going overseas, a 20-year trend—this is where the best oil prospects are. Moreover, in view of the diminishing resource base for oil in the contiguous 48 states, the oil price level, to be effective in reversing this trend, would probably have to move so far from the present field price as to be unacceptable.

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[2] Cf. testimony of the witness in the "Sea Robin" proceeding, Docket No. CP72–6, *et al.*

[3] Cf. Richard C. Gonzalez' separate comments expressed on the National Petroleum Council report, U.S. Energy Outlook (December 1972) as set forth in *The Oil and Gas Journal*, Vol. 70, No. 51, December 18, 1972 at p. 16.

Another way of looking at it is to consider the degree of supply price elasticity for gas. It is generally agreed that the supply is price inelastic, that is that elasticity is less than unity. While there is no definitive elasticity study, at least two competent econometricians consider the coefficient of elasticity to be .5 or less. With a .5 coefficient (a 20 percent increase in price producing a 10 percent increase in findings) the *cost of the incremental supply* will then be in order of $1.50 per Mcf.[4] a figure higher than the cost of landing LNG. And if the producers were successful in moving all prices upward, new and old, to the new standard, the incremental cost would be much higher.

I conclude, therefore, that gas price alone is an extremely inefficient mechanism by which to enhance gas exploration activity by the major oil companies.

One further thought; in terms of exploration in what are known as gas-prone areas, there is no hurry, from the oil companies' standpoint, since the price, they would reason, may well be better next year; the year after; and so on. The general conclusion must be that while the oil companies will continue to find gas, the pace of the finding will, in all likelihood, be inadequate to alleviate the shortage: and will be determined in important part by "nongaseous" considerations.

In this connection it needs to be kept in mind that the *oil* companies do not suffer from the *gas* scarcity; the sale of low-sulfur oils can be calculated to boom, to industry, new residences and stores, at shortage-stimulated prices as the gas scarcity deepens.

Q. With respect to onshore discoveries, what role will the intrastate market play in tying up new discoveries?

A. A very significant role to be sure. Something like one-third of all gas produced (and probably a very much higher percentage of gas newly found onshore) is sold in the state of discovery, in the intrastate market. The latest FPC Report notes sales in this market at prices exceeding area rates by substantial amounts. Furthermore, many of the producers currently selling gas in the intrastate market specify that were the sale to come under FPC jurisdiction, the contract is cancellable.

The price for these sales, largely for industrial and electric power plant purposes, however, still has a distance to go before it bumps into a value ceiling set by low-sulfur oil. Moreover, it may be presumed that there is substantial equipment which will be both very expensive to convert and for which current supply contracts are expiring, creating a value of natural gas in excess of the equivalent Btu value of low-sulfur oil. Consequently, there is little likelihood, in the foreseeable future, of pipelines serving the East Coast being able to secure any appreciable quantities of newly discovered gas in the onshore Texas, Louisiana, Oklahoma, Mississippi, Gulf Coast area, from independent exploration and development companies. The pull of the intrastate market is too strong. (This is likely to be the case even with deregulation.) Consequently, it is only if distributors or pipelines explore *onshore* that the *interstate* market will get its share of new gas reserves there discovered.

Q. Could the production affiliates of interstate pipelines make up this gas shortage?

A. While the pipelines as a group appear to be becoming more active in the exploration field, they are rather clearly not filling the gap. Certainly pipeline exploration should be encouraged and as above noted distributors have generally done so.

However, this is certainly not the equivalent of direct distributor action. Not only do the pipelines apparently not have an obligation which must thus be discharged, but their financial incentive is weakened by their ability to secure rate increases which give them an adequate return at curtailment levels of operation.

Q. In determining what the East Coast distributors might do in this field, what different means were considered?

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[4] $$\text{Incremental Cost} = \frac{\text{New Volume @ New Price minus Old Volume @ Old Price}}{\text{Increment in Volume}}$$

i.e., 1 Mcf, with a targeted increase in volume of 10% and using 45¢ as the base price (the producer's apparent interim target).

$$\text{Incremental Cost} = \frac{1.1\ \text{Mcf} \times 45¢ \times 120\% - 45¢}{.1\ \text{Mcf}} = \$1.44/\text{Mcf}$$

A. Two basic procedures were discussed: one, that a joint venture (using this term in its nonlegal sense) be formed to explore for gas, with capital contributed by the distributors on a given pipeline; or, in the alternative, that the pipeline collect a cents-per-Mcf rate supplement which it would then turn over, by contract, to a distributor joint venture to fund that venture's E&D activity. The pipeline would then have first call on the gas discovered; hence the results flowing from this activity would, of course, redound to the benefit of all the customers on the pipeline.

The obstacles to the first course were such that the second course seemed by far the most feasible; and the AGD Group opted for it. They reasoned that it is their customers who will in any event have to pay for the exploration cost associated with any gas which goes to meet their requirements. The proposal to have them pay for these costs in the form of a rate supplement may very well be the most economical method of providing them with a more adequate indigenous gas supply.

Q. What was done to give effect to this concept?

A. It was readily perceived by the AGD Group that the venture would proceed most effectively on a pipeline-by-pipeline basis, since by so doing the kind of issues raised by Questions 4, 5 and 7 of my quotation from the Commission's Order of March 20 would be resolved to the benefit of all. AGD selected as the first avenue to be pursued, a cooperative venture with Transco, which serves the major part of the supply to many of them. Consequently, discussions were held with officials of this pipeline; and the end result was the filing by Transco of a suggested tariff imposing the E&D rate supplement for this purpose. This filing was made on December 15, 1972 in Docket No. RP73–69.

Q. Will you briefly describe the intended *modus operandi* of this concept?

A. The rate supplement or surcharge is to be collected as part of the total city-gate price and paid over to an exploration entity managed by these distributors; which equity would, through an experienced company (or companies) in the gas production field, enter into exploration programs in areas (largely onshore) which (a) had promise of gas discoveries, and (b) were reasonably accessible to the Transco lines. The gas so found would be offered to Transco, at the price level found by the Commission to be appropriate. The proceeds in respect to both gas sales and liquids sales would constitute a revolving fund for further exploration and development effort. Thus no profits as such would accrue to the entity, but rather, those paying the supplement would be rewarded by receiving an enhanced gas supply.

Q. Is this the only form of E&D activity which these distributors support?

A. They do, of course, visualize this process being extended to other pipelines, so that the whole Eastern Seaboard would receive the benefit of this form of activity. In approving the principle of joint activity, however, individual company programs were *not* considered as being inconsistent with the group effort. These individual company efforts would add much needed additional capital to the search for gas. It was because of this general approval of the appropriate distributor E&D activity, and its concern with the FPC policies developed with respect thereto, that AGD intervened in the Transco-Elizabethtown proceeding, Docket No. CP73–4, and in the current proceeding.

Q. Would you please address yourself now to the specific questions raised by the Commission in its Order of March 20, quoted at an earlier point in your testimony?

A. Before answering this question, I should note at the outset that it does not seem sensible to attempt to make policy rulings in this proceeding which either endorse or proscribe all E&D effort by distributors. The facts relating to Northern Michigan's exploration program and the particular supplies developed therefrom are in the record in this case. The somewhat different traditional activity of integrated distributors such as Consolidated and Columbia is also well-known. I have previously discussed yet another different distributor E&D effort which is pending in the *Transco* case. Still other and different individual distributor exploration programs and proposals are now pending (reference here to CP 73–4 and NI–Gas cases). One might logically assume that additional distributor exploration projects will be before the Commission in the near-term future.

Each of these distributor activities involves different facts and circumstances, different sources of supply and different arrangements for pipeline transportation. To fairly develop any useful policy concerning distributor exploration, the Commission must necessarily approach the issues relating to such policy through analysis of the particular distributor proposals before it, both now and in the future.

In the specific question, this quotation referred, first, to antitrust issues. This is, of course, principally a legal question which counsel can address. Nevertheless, as a layman, it seems quite clear to me that, as a general proposition, there is, basically, no antitrust question raised by individual distributors taking the steps necessary to provide an adequate supply of gas to their customers, continuing to fulfill the function which has always been theirs, of providing an adequate supply of gas to their customers. Whether *joint* activity by distributors, which is not the case here, raises any antitrust issues, our counsel can better answer; though it should be noted that distributors do not compete with each other, but rather with the suppliers of other types of fuel. By finding additional gas by means of an increase in the exploratory effort, they are not preempting any market for themselves and certainly not diminishing competition.

Turning now to the specific questions referred to as public policy issues, Question 1 related to the effect upon the producing segment of the gas industry, arising from the entry of distributors. It is the view of the distributors that the entry of additional competitors in this field is both necessary and desirable and will assist the Commission in its regulatory procedures. In its Permian Basin decision the Commission found that there was but imperfect competition in the production area,[5] one of the reasons for regulation; and it stands to reason that the addition of a competitor for the end market would improve the degree of competition and could conceivably even eliminate the need for the price regulation—though this seems a long way off—given the gas shortage and the limited nature of the exploration activity proposed. The concept of the distributors' David-like stature, in the E&D field, overpowering the Goliath of the integrated oil companies stretches the imagination.

The concern that the distributors would no longer be interested in "exercising a restraining influence on an increase in field price" indicates a lack of knowledge of the very real competitive situation faced by distributors in their market areas (with fuel oil and electricity), with field prices leapfrogging, and their resultant great concern to keep all of their costs down, let alone the cost of purchased gas. This need for cost control is all the more present now since the growth which the industry enjoyed in the 1950s and 1960s has now tapered off and this was the only means by which they kept prices down and their competitive status virile in the face of generally inflationary conditions. Furthermore, it might be pointed out that it is the Commission which exercised the restraining influence over increases in field price, on the basis of testimony in important part offered by its own staff, though the distributors may have offered evidence they considered helpful; and can be counted on to continue to do so where there is a contribution they can make. The Commission will certainly continue to exercise its review of contract prices proposed by gas sellers—be they producers, pipeline affiliates, or distributor affiliates.

One should not over-emphasize the effect which distributors may have had up to now in restraining increases in field prices. True, their testimony may have been helpful to commissions from time to time in reaching their conclusions. However, the structure of the industry precludes their having a positive effect on price. It is the pipelines who conducted whatever bargaining took place—when the demand-supply balance permitted it—the distributors were far removed from the bargaining table.

As to the nature of the competition in the producing areas, it is of course to the Eastern gas companies' direct advantage to find gas a cheaply as possible, in order that they may compete effectively for the heating market. Consequently, it would be reasonable to expect *more* effective competition in the producing areas, between two industries which are themselves directly competitive in the marketplace.

To sum up, it seems that the entry of distributors into the gas E&D activity is a pro-competitive action which the Commission should encourage. Equally obviously, distributors will never dominate this field because of the far greater size and investment potential of the oil companies (whose primary interest in the discovery of liquids will, of course, continue).

Q. Would you address yourself now to the Commission's second area of interest?

A. This relates to the potential "preemption of pipeline capacity by distributors." Would that there were a problem! Unfortunately, the Staff's forecasts, as well as the pipelines' and distributors' forecasts, indicate that at best, the efforts discussed herein, as well as all other efforts, will only tend to fill the present pipelines; they will not create a preemption problem. Indeed, it is the expressed intention of the AGD Group that were its unfortunately pessimistic forecasts to turn out to be ill-founded and there would be no need for continuing this particular effort, it would be abandoned. Simply stated, this question will probably not be present in most pipeline transportation proposals. However, where a preemption problem exists, it can and should, of course, be dealt with directly by the Commission based on the facts presented in the particular proceeding.

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[5] In a recent proceeding (CI73-293, *et al.*), the Chief of FPC's Division of Economic Studies went even further suggesting that there is currently no viable competition in the producer segment of the natural gas industry.

Q. What about the third question, having to do with curtailment plans?

A. Where these gas increments become a part of the pipeline's total supply this question does not arise (and, therefore, subject to curtailment plans as required).

I should add however that in instances where the capital devoted to exploration and development comes from the company, it seems only appropriate that the supply discovered be just as much a part of its own supplies as would peak-shaving gas, and therefore beyond the reach of curtailment plans. AGD recognizes that in those instances, protection to the non-participating customers would, of course, have to be afforded so that they would not be adversely affected by the transportation element of the transaction.

Q. What about the common carrier question raised by the Commision?

A. This is primarily a legal issue. So far as I know, pipelines to the extent they are carriers at all and are not marketing their own gas are contract carriers. I am advised that the Natural Gas Act does not contemplate common carrier treatment of pipelines. Absent new legislation the common carrier issue cannot arise.

Q. What about the fifth question, relating to the consequences upon small distributors?

A. Distributors, be they small or large, have the identical responsibility of service to their customers. For the smaller companies, particularly, the wider their range of alternatives, including exploration activities either jointly or independently conducted, the better they may discharge this responsibility. Particular concern for small distributors is of course met by the group exploration alternative.

Whether individual distributor applications create a problem depends on one's view of the natural gas resources. It is true that there is probably a finite amount of gas yet to be discovered in the century ahead (though no one knows what it is), but at least at this stage of development, increased exploration activity will only enlarge the total supply and need not at all "take away any gas" from companies not engaging in this activity. Even with the entry of distributor activity, the production and pipeline segments of the industry will pursue those gas supply programs which they believe will produce an adequate return irrespective of distributor efforts—the market is big enough for all.

Q. Would you please address yourself to the sixth area of concern of the Commission, the "effect upon competition at each industry segment—production, transmission, and distribution—and the overall public interest."

A. I have already stated that it appeared to me that the entry into E&D activity by distributors would improve competition in *that* area of activity; and have suggested that if this entry is successful, competition in the ultimate marketplace will also be improved, in that gas and oil (and electricity) will be free competition; the only question which remains has to do with the effect upon the transmission segment. If the proceeds of the discovery of gas as here proposed become available to "fill up the transmission lines," the welfare of that particular segment of the industry will actually be improved, and to that extent, of course, also, the public interest will be served. Demand charges will be lower for all the customers; moreover, the need asserted by the pipelines for higher depreciation rates diminishes as the useful life of the pipelines lengthens. Absent the "filling up" of these lines, and with deeper and deeper curtailments, demand charges on the transmission of gas could well become noneconomic if they continue to be adjusted upwards in an effort to maintain the pipeline's overall return.

Q. What about the last area of concern—the reservation of gas for the distributors' own use?

A. In the first place, gas distributors, unlike pipelines, have an obligation as public utilities to serve the requirements (residential, commercial and industrial) for gas within their franchise areas. To deny a distributor an opportunity to attach gas reserves which have been discovered and developed at his initiative may well deprive him of the capacity to meet his public utility responsibility. This is why in my response to a previous question I have indicated that gas found by the use of the funds advanced by a distributor group or a distributor should appropriately accrue to their or his customers' benefit, without detriment to suppliers in other areas if as we believe, the total available supply is enhanced. Thus this benefit will redound to all consumers.

In sum, therefore, I find that the Commission's various questions may be answered positively and that the public interest would be advanced by appropriate proposals for distributor exploration and development. Vertical integration is not a new development but an on-going feature of the gas distribution industry. If the distributors are prohibited from making this effort they may be unable to meet their responsibilities to the areas they are committed to serve.

Appendix D

COSTING NOTE

In the cited *Belco* case, the Commission majority ignored its Staff's evidence and by some rather tortuous mathematics found *cost support* for its rate *finding*—45 cents per Mcf—virtually double its finding of some two years previous. Now, key to the computation of cost are two factors—the cost per well drilled, and the gas findings per well. All agree that the former is increasing; but this does not account for the wide swing. What has happened is that with the decline in exploration, the *reported* findings in recent years have turned down drastically—even discounting the accompanying "journal entry" nature of *negative* revisions to previously reported reserves—to roughly one-half the pre-existing level. This is all the more startling, at first blush, when exploration efforts have concentrated, to a much greater degree in the offshore Louisiana area, where findings per foot drilled are several times the national average. The explanation may in all likelihood be found in two nonrecurring factors: First, the 1960s produced a relatively meager effort by Interior in making offshore acreage available[1] so that, with the usual lag between initiation of exploratory effort and the reporting of reserves,[2] we could have expected a severe dip in average findings in recent years. Second, when a major lease sale was finally held in late 1970, the indicated success of the drilling effort on this acreage was not reflected in either the 1971 or the 1972 *reported* findings, judging from the activity in placing platforms over acreage where successful exploratory wells had been drilled. In the *Belco* case earlier cited, statistics derived from the latter measure, a reasonable yardstick considering the enormous investment the 36 platforms represent, findings of some 5 trillion cubic feet are indicated compared with *reported* proven reserve additions to date of *less than a tenth* of this figure (the exact figure is not yet available). In some year, these findings *will* be reported, but all we can say at the moment is that there is a serious mismatch in the *reported* more expensive drilling costs and the reports of the reserves. When these reports catch up, *computed* costs are likely to be markedly lower, though *actual* costs may well be higher. The majority's cost findings—Chairman Nassikas again dissenting—are seriously infected by this mismatch.

This points to another problem in applying effective regulation—the paucity of relevant cost data. This is in three principal areas: overall lack of continuous cost data; a lack of differential cost data, offshore versus onshore, necessary because of the increasing importance of the former area; and, finally, out-of-phase and inadequate reports on the gas actually found. The FPC has several times marched up the hill of requiring adequate cost data to be reported on a geological and periodic basis, only to march down again in the face of oil company resistance. It has not faced the issue of the timeliness and scope of findings reporting, equally relevant to a cost determination.

In sum, we may presume costs are somewhat—indeed appreciably—higher than they were when the opinion was written in the second Southern Louisiana proceeding (1970), but how much higher we do not know, nor is the data available to make that finding.

Senator HART. Now on the theory that after somebody has listened to a lot of testimony, you have developed great wisdom. There is a tradition around here that we make closing statements.

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[1] Only one major wildcat acreage sale between 1962 and 1970.

[2] Figures indicate that the findings from the 1967 lease sale are not anywhere near being fully reported yet!

Now the hard truth is that I have attempted to follow the testimony in these 3 days as closely as the next fellow, but my head is reeling, just as I suspect many others find their heads reeling.

But I do owe to those who are interested in the subject some indication of a tentative feeling and some indication of what suggestions might result from the hearings.

First impression certainly is that those of us who were worried that the figures on the so-called gas supply, that the American Gas Association figures and Federal Power Commission figures showed—the concern that we weren't on solid ground with those figures has been confirmed.

I am almost sorry that we had to hear the testimony from the Trade Commission. The Trade Commission, you recall, yesterday came in with their flat statement that in all cases investigated by them the AGA figures were an understatement of the natural gas reserved that were carried on the company's own records, and you don't take comfort in that kind of news.

And when I first asked the Trade Commission in 1970 to investigate the problem, I suggested that the FPC halt any natural gas price increases until the validity of the figures was established, and suggested that if they did go ahead and grant increases that there be an escrow arrangement.

That wasn't done. There have been increases, and that's over the dam. Now what can we do about that?

Well, you can consider legislation halting further increases in price until we get more solid figures, propose legislation that would seek to undo price increases that have been applied, a rollback, so to speak. And legislation could be introduced proposing explicitly that the Commission follow a cost-plus method for new gas, not the optional pricing approach.

These are things that one decides after mulling over this record. There is one legislative proposal which requires less thought, and that's bringing interstate gas sales under the jurisdiction of Power Commission. I think that makes good sense.

And I think a solid record has been built here that, absent this type of regulation, it's possible for interstate producers to bid up prices in the intrastate market, and then that intrastate price is used as a bargaining device for increases in interstate prices.

I have asked the staff to develop an early draft report on these hearings.

I have asked for recommendations on holding early hearings on reorganizing this industry, this entire industry, under the proposed Industrial Reorganization Act.

I think "crisis" is a fair way to describe the situation the country is in with respect to energy, and the staff, I am sure, will respond with speed and concern, and then we'll know, I think, better what has been proved here and what we should do about it.

Before closing this set of hearings, I do want to thank everyone that made the arrangements and prepared it, but particularly to Mr. Nash who was primarily responsible. I think he has developed a thorough record in an extremely difficult subject area.

Mr. CHUMBRIS. As I understood from the chairman when we opened the hearings back on June 8, that there would be opportunity for others who wished to appear to submit data. Are we leaving that open now?

Senator HART. Indeed, yes.

Mr. CHUMBRIS. Because I wasn't sure.

Senator HART. We are adjourning subject to the call of the Chair, but I want at least from the majority staff—I welcome yours—a very quick report to try and pull together what we've got.

Mr. CHUMBRIS. Yes; I didn't want the record to show that this would be the full report on the hearing.

Senator HART. No.

Mr. CHUMBRIS. Thank you.

Senator HART. We are adjourned.

[Whereupon, at 3:11 p.m., the hearing was adjourned, to reconvene Tuesday, October 18, 1973, in room 2228, Dirksen Senate Office Building (see pt. 2).]

APPENDIX

SUMMARY OF REMARKS OF HASKELL P. WALD, CHIEF, OFFICE OF ECONOMICS, FEDERAL POWER COMMISSION, AT THE AMR OIL AND GAS SEMINAR IN NEW YORK CITY, JANUARY 31, 1973

FPC NATURAL GAS REGULATION

The method of controlling the field price of natural gas sold in interstate commerce has undergone significant changes since the U.S. Supreme Court's 1954 decision in the *Phillips* case. The FPC first experimented for six years with individual producer cost-of-service regulation. It then turned to the area rate method of regulation and a dual price system linked, in effect, to a hold-the-line policy on new gas prices. This approach was workable while gas supplies were adequate and there was no national problem of inflation. The events of recent years have made it necessary for the FPC to take action on a broad range of policy, decisions to cope with the gas shortage. Incentive increases in wellhead prices, along with a more flexible regulatory policy, have been the main thrust of these decisions.

At each stage of development of gas producer regulation the controlling policy consideration, except for recent emergency sales, has been the statutory requirement of "just and reasonable" rates. In everyday language this means that the price to the consumer must not be more than necessary to give the producer an adequate incentive to search for and find new gas reserves to replace current production and meet the expected growth in consumption. A fundamental issue in the current controversy over the need for wellhead price regulation is whether the forces of competition, operating in a free market, would by themselves guarantee the equivalent of a "just and reasonable" price for gas. This issue, on which there is a sharp disagreement of views, is discussed at a later point in these remarks.

NOTE.—These remarks do not necessarily reflect the position of the Federal Power Commission. The opinions and conclusions are the author's personal views.

Implementation of Area Rate Program

The interim area rate ceilings established in 1960 included a novel feature which acquired large significance in the subsequent area rate proceedings. Two separate "guideline" prices were established for each producing area, one for initial prices in new contracts and the other for increased prices in existing contracts. The new gas ceiling was set at the highest contract price at which substantial quantities of gas had been sold to date. The old gas ceiling approximated the then existing average of contract prices on flowing gas. This price "vintaging", as it came to be called, recognized the lower cost of older gas, most of which had been discovered as a by-product of the search for oil and before the inflation of the late 1950's had had its full impact on exploratory and development costs. To aid further in holding the price line in this early period, the FPC outlawed indefinite price escalations in new producer contracts and encouraged rate settlements. These often required refunds and rollbacks on rates which exceeded the guideline levels.

The Permian Basin Area Rate Proceeding, concluded in 1965, was the first evidentiary hearing to establish area rates. It was a regulatory milestone which, as the FPC made clear, was intended to set the pattern for future area rate decisions.

The premise of the Permian decision was a conclusion, later affirmed by the Supreme Court, that the nature and extent of competition in the field market for gas was insufficient to protect consumers against excessive prices. Undoubtedly the outstanding feature of the decision was the adoption of a cost-based two-price system. Its purpose was to reduce the "windfalls" on old gas while permitting a higher price for new gas as an incentive for finding future gas supply. As a working hypothesis for its costing methodology, the FPC accepted the "directionality" thesis regarding the industry's abiilty to search for oil or gas with a reasonable degree of accuracy of prediction. The new gas price of 16.5 cents per Mcf in the Permian decision was closely in line with the then going market price in sales to interstate pipelines and higher than the prevailing price in the intrastate market. Most of the refunds producers were required to make were related to price escalations for old gas.

In affirming its commitment to the area rate approach the FPC called attention to the built-in incentives for improved efficiency and technological innovation. At a given area price the individual producer who succeeds in cutting costs will reap above-average profits. In contrast, the individual company cost-of-service method of regulation provides no incentive for cost reduction.

The area rate program entered a new phase in 1969, when the future adequacy of gas supply became a matter of serious concern. Its culmination was the second Southern Louisiana Rate Opinion issued in 1971. The FPC had been presented with a rate settlement agreed to by most of the producers, pipelines, and distributors who were parties to the proceeding. The settlement rates, which were substantially higher than any previously approved area rates, became the basis not only for the Commission's Southern Louisiana decision, but also for its decisions for the remaining major producing areas. The rates in Hugoton-Anadarko, however, were based on an earlier settlement proposal with somewhat lower rates. The 1971–72 area rate decisions also included a valuable incentive feature of the Southern Louisiana settlement agreement. Producers were permitted to discharge their refund obligations through new dedications of the gas interstate market.

By 1972 the national average level of area rate ceilings had been increased to about 25 cents per Mcf, compared with the pre-1971 average of 17 cents. Expressed in dollars of constant purchasing power, the 1972 average level was about 10 percent higher than in 1960 when area rates were first imposed.

FPC responses to the gas shortage

Because of the critical gas supply situation, several modifications of the area rate program have been made in the past three years. The modifications include emergency exemptions and special relief from the rate ceilings, non-price supplements to producer revenues, and a new optional procedure for certificating new gas sales at above-ceiling rates. The FPC's purpose has been to allleviate the gas supply shortage by giving producers an added incentive to find new gas reserves and by making it more attractive for anyone with gas for sale to make the gas available to the interstate market.

One of the first new actions was in October 1969 when gas from newly discovered reservoirs on previously dedicated acreage was made eligible for the new gas prices. A few months later the FPC announced its advance payments program which permits pipelines to make advances to producers and to include the amounts as part of working capital in their rate base. This program was recently modified and extended until December 31, 1973. The interstate pipelines committed more than 1¼ billion dollars as interest-free loans to producers during 1970–72. This sum would cover more than half the cost of drilling and equipping all the oil and gas wells drilled in the United States in 1971.

Under the terms of a rulemaking notice issued in June 1970 the FPC has authorized several large-volume sales at above-ceiling prices in the Permian Basin, pending the completion of a "second round" Permian rate proceeding. Another FPC order has permitted pipelines to make emergency purchases for periods up to 60 days without advance authorization. These purchases are not limited to ceiling prices.

In March 1971 the FPC amended its regulations to exempt small producers from area rate ceilings, and to provide for regulatory surveillance in pipeline rate proceedings where the prices paid to small producers will be reviewed. This action, however, was recently set aside by the U.S. Court of Appeals on the grounds that the FPC had exceeded its authority under the Natural Gas Act.

Another special price relief provision widely used by the pipelines since April 1971 is the FPC order permitting purchases at above-ceiling prices under limited-term certificates with pre-granted abandonment authority to the sellers. The prices under these certificates have ranged up to 40 cents per Mcf and the term of the sales has usually been one year or a little longer. To be eligible to make these purchases the pipelines must demonstrate an emergency need for gas on their system.

Probably the most significant of the recent actions to provide more flexibility in administering wellhead price regulation is the August 1972 order establishing a new optional procedure for the certification of new gas sales. It permits producers who satisfy certain preconditions to apply for sales certificates at above-ceiling prices. If the FPC concludes that the prices are required by the public interest, the higher prices may be collected without being subject to possible future refund. The first evidentiary hearing under the new procedure is now underway. The hearing involves three applications for sales at 45 cents per Mcf from the Federal domain offshore Louisiana where the area ceiling is 26 cents. The parties to this proceeding have been instructed not to rely on cost evidence alone, but also to consider non-cost factors of supply and demand, required capital formation, and the probable industry response to any given level of rates.

Finally, in a recent decision denying petitions to set new ceiling rates in the Appalachian and Illinois Basin Areas, the Commission expressed its intention to move toward the elimination of the present two-price system based on contract date vintaging. Accordingly, producers will be permitted to collect new gas prices when their flowing gas contracts expire and a new sales contract is executed.

Causes of Gas Shortage

To understand the paradox of a gas shortage in the midst of a plentiful "potential" supply, it is essential to recognize that FPC regulation of gas producers has been beset by many obstacles in recent years. These include several significant developments originating outside the gas industry itself. For example: (1) the market forecasts on which the industry's planning was based during the 1960's did not contemplate the large expansion of the market due to the imposition of air quality standards; (2) the industry's supply curve shifted because of high interest rates and other cost increases attributable to inflation; (3) well drilling in the offshore areas, which seem to offer the best prospect of prolific new finds, was cut back because of the temporary halt of Federal lease sales after 1967; (4) the depressed state of the domestic oil industry probably had a large negative effect on additions to gas reserves, since it appears that from 25 to 40 percent of the gas discovered in recent years has been the result of a search for oil. The role of FPC regulation as another contributing cause of the gas shortage should be analyzed in the context of the market imbalance from these other sources.

Between 1961 and 1969 there was an erosion of about 15 percent in the weighted average of the area ceilings because of inflation as measured by the overall wholesale price index for industrial commodities. In the meantime the legality of the area rate approach was uncertain until 1968 when the first area rate proceeding (*Permian*) was affirmed by the Supreme Court. Several other rate proceedings had been started employing the *Permian* methodology and hearing procedures, the next in line being the Southern Louisiana case which was first decided soon after the Supreme Court's *Permian* decision and later reopened for further hearing. Being locked into a regulatory mechanism which was exceedingly time consuming, the Commission could not complete the adjustment to a new and higher level of ceilings to correct for the price erosion until 1971 and 1972. This was too late to forestall a decline in drilling activity and a general retrenchment by the industry in bringing new supplies to the market.

Recognizing how important it was to reduce the regulatory lag to the practical minimum, the FPC decided against initiating evidentiary proceedings in the two remaining pricing areas, Appalachia-Illinois and Rocky Mountain. Instead, the new ceilings in these areas were established in rulemaking proceedings completed in 1969 and 1971.

Because of the inflexibility of the principal regulatory mechanism for revising the area rate ceilings, the FPC decided, as explained above, that it was necessary to experiment with various policy expedients which might help immediately to relieve the growing gas shortage in the interstate market, and also to make available the optional certification procedure establishing new ground rules for relief from the rate ceilings. These actions, however, had an unfortunate and probably unavoidable side effect because they added to the regulatory uncertainty that already existed as a consequence of the many appeals of the Commission's decisions in the courts. Furthermore, a new dimension of uncertainty was introduced with the mounting campaign against the continuance of producer regulation. As viewed by the critics, the gas shortage was positive proof that regulation was unworkable and should either be abolished or else modified in a major way.

Regulatory uncertainty has a pernicious effect on gas supply. Especially when the uncertainty fosters expectations of higher future prices, as seems to be the case at present, it encourages producers to defer making new capital commitments even though a pay-out calculation may show a good profit at today's ceiling prices. A profit-maximizing producer or royalty owner will ask whether the cost of foregoing an early sale is likely to be more than offset by further appreciation of the value of his asset. Due to the prevalence of regulatory uncertainty, the recent trends in drilling activity have not provided a valid test of the adequacy of economic incentives under the new ceiling levels.

Reasons for regulation of gas producers

It is obvious that gas producers are not "natural monopolies" or public utilities operating under a franchise from a public authority. But it is equally obvious that many aspects of the gas producing business are not found in unregulated industries.

The gas industry—defined to include producers, transmission companies, and distributors—has these distinguishing characteristics of a public utility: (1) the sellers of gas to ultimate consumers are monopolies; (2) the three subsectors of the industry are physically interconnected; (3) the service that is provided is essential for the public welfare; and (4) the gas transmission and distribution companies are granted the power of eminent domain. This combination of circumstances would seem to require regulatory control of prices at the point of initial sale, since these prices become costs to subsequent sellers who are regulated. Moreover, because of the expense and durability of gas burning equipment, large segments of the end-use market are captives of the industry and therefore have a claim to the protection provided by regulation. Similarly, the heavy cost of transmission facilities, which require long-term purchase and sales contracts for their financing, severely limits the opportunities for distributors to switch to other suppliers or for pipelines to divert their purchases from their traditional supply areas to new areas where lower cost gas may be available.

Not only the technology of the gas industry but also the industry's economic structure imposes a barrier against effective buyer-seller competition. The dominant market power resides with the major producers by virtue of the vast resources at their command and their joint ownership of oil and gas, and often coal as well, which are competing products at the point of final sale. A loss of markets from higher gas prices is likely to be more than made up by larger sales of other fuels at higher prices. Furthermore, a "community of interest" responsibility exists among the producers as a result of such business practices as joint bidding on leases, joint ownership of operating fields, lease farm-outs and joint negotiations at the international bargaining table.

The individual pipelines, on the other hand, do not have the necessary flexibility to bargain from a position of economic strength. Their future growth depends upon their success in acquiring new supplies. Unlike the producers, the pipelines cannot afford to hold back for a period as part of their bargaining strategy. Any markets which they lose by doing so may never be recovered. Indeed, the representation of the consumer's interest at a bargaining session on a gas purchase contract is likely to be minimal. A higher cost for purchased gas is unlikely to affect the profits of a pipeline whose rates are regulated on a cost of service basis. Several pipelines even have a financial stake in higher wellhead prices because they either own gas reserves or have producing affiliates.

The potential for the exercise of market power is of course greatest at a time of shortage as at present. Without the continuing restaint of FPC regulation—and assuming that the sellers would not be restrained by the Phase III anti-inflation program—the escalation and renegotiation provisions in existing contracts would go into effect and the prices in new contracts would rise to the immediate "scarcity value" of the gas. The new prices would be far higher than the necessary cost of new supplies. There would also be an upward price realignment of fuels which are sold in unregulated markets in competition with natural gas.

This risk of "runaway" prices exists because of the magnitude of the unsatisfied demand for gas and because of the low elasticity of gas supply with respect to price in the short run. Over the longer run the supply response may be sufficient to eliminate a price premium reflecting "scarcity value," but this would occur only after many long-term contracts had been made at the inflated price levels. . . .

While it is clear that the regulatory program must be accomodated to the immediate situation of a critical gas supply shortage, this does not mean that the statutory requirement of "just and reasonable" rates is no longer the appropriate pricing standard. The necessary supply elicitation can be achieved under regulation at prices that are less than the sellers could obtain by exercising their market power in an unregulated market. It is the FPC's responsibility to safeguard against possible abuses of market power in a sellers' market and against any price escalation that does not promise an increment to supply that would not otherwise become available.

Improvements in regulatory methods and procedures are possible and are a constant objective of current FPC efforts. The chief opportunities are through the clarification of pricing standards, guaranteed certainty against prospective reduction of initially certificated prices, and more expeditious hearing procedures for adjusting the rate ceilings. Other proposals may come out of the FPC's National Gas Survey to be issued later this year. Above all, it is necessary to eradicate the open-ended price expectations which have been fostered by the uncertainty over regulation's future.

The outlook

The higher gas prices now being allowed should allay the previous concern over the adequacy of profit incentives for new gas exploration and development. While it is true that many of the gas fields now being developed appear to be less favorable to large discoveries than was the case in earlier years, it is not at all clear that the overall national finding rate per foot drilled is on a declining curve. The offshore leases have been highly productive and the potential for large new finds as more offshore tracts are made available is believed to be large. Deeper onshore drilling, while expensive, has in the past yielded a good return and here, too, there is a large potential according to authoritative estimates.

Several forecasts have been published showing a widening gap between supply and demand in the years ahead, even after apparently realistic allowances for increased imports from Canada, LNG imports from overseas, and gas from naptha feed stock and coal. These forecasts, however, may prove to be examples of the type of "programmed pessisims" which excludes various potential developments because they are too difficult to quantify. On the supply side, there is no explicit allowance in the forecasts for the probable response of domestic production to the higher gas prices now being allowed and to the increases in oil prices now being widely predicted. The available econometric studies suggest that the supply response tends to build up rapidly from year to year. On the demand side, it is not at all clear that there is adequate recognition of the demand shifts that will eventually result from higher prices. In short, as seems to be the case with energy projections generally, too little attention is given in these forecasts to the operation of market forces. The forecasters seem to ignore how previous market imbalances were corrected after a significant change in the trend of economic incentives.

While it may be premature to interpret the drilling statistics for 1972 as signaling the start of a recovery in domestic supplies, the increases over the previous year are too large to be dismissed as random fluctuations. Based on the cumulated totals for the first 3 quarters of 1972, the number of gas wells drilled increased by 23 percent and exploratory gas well footage increased by 19 percent. Because these increases far exceeded those for oil, it is very possible that they represent the industry's initial response to the relaxation of FPC restraints on prices. Moreover, all of the advance in gas well activity was on onshore leases. There was no increase in offshore activity, which has been curtailed because of infrequent lease sales.

In conclusion, the FPC's efforts to accelerate the transition to a more viable method of gas producer regulation should be seen as part of the government's overall energy program. The gas shortage is a manifestation of a tight supply situation for all fossil fuels. Thus, the escape value of interfuel substitutability cannot operate as effectively today as in past periods. How best to meet this overall energy problem which affects the very foundation of the Nation's welfare is being given priority consideration by both the Executive and Legislative branches of our government.

FEDERAL POWER COMMISSION—ORDER UPDATING NATIONWIDE INVESTIGATION

(18 CFR Part 2)

Before Commissioners: John N. Nassikas, Chairman; Albert B. Brooke, Jr., Rush Moody, Jr., and William L. Springer.

Reliability of Electric and Gas Service. Docket No. R–405.

(Issued August 1, 1973)

In our notice of investigation and proposed rulemaking with respect to developing emergency plans which was issued in this docket on November 4, 1970, we sought with regard to the natural gas industry to elicit information so as to enable us to assess the adequacy and reliability of the gas supply and deliverability to meet consumer demand for the oncoming winter season and four winters following. Evidence of anticipated curtailment of necessary service has impelled the Commission to take continuing affirmative steps in the public interest to obtain reliable factual information regarding the sources of available gas and the facilities existing and planned to deliver such gas to meet consumer demands and to determine the terms and conditions of a rule or rules necessary to avoid or minimize the consequences of any emergencies that may develop. On September 12, 1972, the Commission issued an order updating its investigation. Amendments of the Commission's regulations proposed in this docket are still under Commission consideration.

Pursuant to this action and in the implementation thereof the Commission directed all of the large gas producers whose individual jurisdictional sales of natural gas totalled in excess of 10 million Mcf annually to respond thereto on forms designed to elicit the information necessary for Commission consideration. The responses were designed to cover separately the time frames set forth in the notice and in the updated order.

The responses received pursuant to said orders have been particularly useful to the Commission in enabling it to assess problems which have arisen as a result of shortages in the gas supply and to take steps designed to meet them.

To enable the Commission to have a better understanding of the problems prevailing in the industry, data almost identical in form to that previously supplied should be submitted for evaluation and appropriate action. For the purpose of this continued investigation the current data should relate also to two time periods, one as of December 31, 1972, and the other as of June 30, 1973. After receipt and analysis of such information, the sources thereof may be subject to audit by the Commission's staff.

Because of steps required to be taken by the Commission pursuant to Congressional *subpoena duces tecum* issued June 21, 1973, our treatment of information submitted pursuant to this order cannot be accorded the confidentiality heretofore authorized and honored by the Commission. The Commission's orders issued November 4, 1970, and September 12, 1972, providing for the nationwide investigations of reserves of natural gas directed that the reserves data submitted pursuant thereto would be held in a confidential status in accordance with the provisions of Section 8(b) of the Natural Gas Act, 15 U.S.C. 717g(b), and the Freedom of Information Act, 5 U.S.C. 552(b)(4) and (9).

The Chairman of the Senate Judiciary Committee's Subcommittee on Antitrust and Monopoly requested disclosure to the Subcommittee and the Federal Trade Commission of such data, and our efforts to comply with such requests as fully as possible without violating the conditions of confidentiality under which the reserves data had been obtained were unavailing. Instead, the Chairman of the Subcommittee, acting on behalf of the Subcommittee, issued a *subpoena duces tecum* directing the Commission's Chairman to appear before the Subcommittee on June 26, 1973, and to produce all data in the Commission's possession, custody or control or of any member or employee thereof referring or relating to the Commission's order dated September 12, 1972, including all workpapers and composites resulting from the material received in connection with that order.

In order to avoid placing the Commission's Chairman in jeopardy of contempt of Congress by refusing to disclose the data protected by our order of September 12, 1972, by order issued June 22, 1972, the Chairman was authorized to deliver, under protest, the data described in the *subpoena*. The Subcommittee has not decided whether to maintain the confidential status of the subpoenaed data, whether to publicly disclose such data, or whether to disclose such data to the Federal Trade Commission. Inasmuch as the protection heretofore provided for proprietary data can no longer be assured, we are unable to represent to the respondents that the data submitted will not be made public.

We have heretofore recognized that data such as that sought by this order is confidential and proprietary in nature, the public disclosure of which could result in irreparable injury to the owner and to the public. We will not, therefore, require filing of the data herein sought until any producer who opposes the filing of data without an assurance of confidentiality has been afforded an opportunity for hearing on this issue.

It is ordered that:

1. The investigation initiated by further notice issued on November 4, 1970, in Docket No. R–405 be further updated, and the natural gas companies listed in Appendix A are requested to file responses to the questionnaires set forth in Appendix B; that such responses may be submitted in hand to Mr. Leon H. Friedlander at Room 7312L, 825 North Capitol Street, N.E., Washington, D.C. 20426, in a sealed envelope plainly marked "Responses to Order issued August 1, 1973, Docket No. R–405" or or before August 22, 1973. Any questions regarding said forms should be directed to Mr. Friedlander, who may be reached by telephone at 202–386–5735.

2. For the purposes of this investigation any responses submitted in compliance herewith shall be made available for inspection or copying by the public; individual company information received as a result of this continued investigation will not be maintained in confidential status. The Commission cannot, in the light of Congressional demands as above set forth, assure confidential status for the data to be submitted pursuant to this order. See "Order of Modification to Authorize Compliance With Congressional Subpoena Duces Tecum" issued June 22, 1973, in this docket. It should be noted that all responses will be made at the Federal Power Commission Offices in Washington, D.C.

3. After receipt and analysis of the information requested pursuant to paragraph 1. hereof, the data upon which the responses were predicated shall be made available for audit by the Commission's staff in the offices of the producers.

4. If voluntary response to the data request herein made is not sufficient for Commission assessment of gas supply and deliverability, appropriate proceedings may be instituted, after notice, to consider whether the reporting and disclosure of uncommitted reserve data by producers should be compelled.

5. The Secretary shall cause prompt publication of this order to be made in the Federal Register.

By the Commission.

Mary B. Kidd, *Acting Secretary.*

Appendix A

Amerada Hess Corporation.
American Petrofina Company of Texas.
Amoco Production Company.
Anadarko Production Company.
Ashland Oil and Refining Company.
Atlantic-Richfield Company.
Austral Oil Company, Inc.
Aztec Oil and Gas Company.
Bass Enterprises Production Company.
Perry R. Bass.
Belco Petroleum Corporation.
Beta Development Company.
Cabot Corporation.
California Company, A Division of Chevron Oil Company.
Champlin Petroleum Company.
Chevron Oil Company, Western Division.
Cities Service Oil Company.
Clinton Oil Company.
Coastal States Gas Producing Company.
Colorado Oil and Gas Corporation.
Coltexo Corporation.
Columbia Gas Development Corporation.
Continental Oil Company.
Edwin L. Cox.
Diamond Shamrock Corporation.
Dorchester Gas Production Company.

Exchange Oil and Gas Company.
Exxon Corporation.
Forest Oil Corporation.
General American Oil Company of Texas.
Getty Oil Company.
Gulf Oil Corporation.
Helmerick & Payne, Inc.
J. M. Huber Corporation.
Hassie Hunt Trust.
Hunt Oil Company.
Imperial American Resources Fund, Inc.
The Jupiter Corporation.
Kerr-McGee Corporation.
King Resources Company.
Lone Star Producing Company.
Louisiana Land and Exploration Company.
LVO Corporation.
McCulloch Gas Processing Corporation.
Mapco Production Company.
Marathon Oil Company.
Mobil Oil Corporation.
Monsanto Company
Murphy Oil Corporation.
Natural Gas and Oil Corporation, A Division of River Corporation.
North East Blanco Development Corporation.
Northern Natural Gas Producing Company.
Ocean Drilling & Exploration Company.
Petroleum Inc.
Phillips Petroleum Company.
Pioneer Production Corporation.
Placid Oil Company.
Pennzoil Company.
Pennzoil Producing Company.
Pubco Petroleum Corporation.
The Rodman Corporation.
Shell Oil and Gas Company.
Signal Oil and Gas Company.
Signal Petroleum Successor of Lake Washington Inc. and U.S. Oil of Louisiana Inc.
Skelly Oil Company.
Sohio Petroleum Company.
The South Coast Corporation.
Southern Natural Gas, Jr. Venture.
Southern Union Gathering Company.
Southern Union Production Company.
Stephens Production Company.
Suburban Propane Gas Corporation.
Sun Oil Company.
The Superior Oil Company.
Tenneco Oil Company.
Tennessee Gas Supply Company.
Terra Resources Inc.
Texaco Inc.
Texas Gas Exploration Corporation.
Texas Oil and Gas Corporation.
Texas Pacific Oil Company, Inc.
Transocean Oil, Inc.
Union Oil Company of California.
Union Texas Petroleum, A Division of Allied Chemical.

Appendix B

Warren Petroleum Company, A Division of Gulf Oil Corporation.

Question A. Will you please state your name, the name of your company and your position with the company?

Question B. Are you authorized by your company to furnish the information requested in the following interrogatories?

Question C. If not, will you please state the name or names of the official or officials of your company who have such information?

Question D. Do you understand that the designated Commission employee will combine the information obtained from you with information obtained from others and file a composite report in the public files in Docket No. R–405?

Question E. Will you please state the net working interest volumes, including associated royalty interest volumes, of proved recoverable reserves of non-associated natural gas in MMcf, at 14.73 psia and 60 degrees Fahrenheit, that your company had available for sale as of December 31, 1972, for the areas hereinafter designated? (For the purpose of questions E–J, the term "proved reserves" is used as defined by the Committee on Natural Gas Reserves of the American Gas Association and such definition is set forth on Appendix B–8 of this letter. The volumes held "available for sale" in questions E–J are those which are not covered by gas purchase contracts and are not reserved for direct industrial contracts, not company use-warranty gas or not company use-fuel and feedstock.)

What are the volumes in:

1. Alaska?
2. Northern Arkansas?[1]
3. Southern Arkansas?
4. California?
5. Offshore California?[2]
    (*a*) Federal
    (*b*) State
6. Colorado?
7. Illinois?
8. Indiana?
9. Kansas?
10. Kentucky?
11. North Louisiana?
12. South Louisiana?
13. Offshore Louisiana?[2]
    (*a*) Federal
    (*b*) State
14. Michigan?
15. Mississippi?
16. Montana?
17. Nebraska?
18. Northwest New Mexico?
19. Southeast New Mexico?
20. New York?
21. North Dakota?
22. Ohio?
23. Oklahoma Panhandle area?[3]
24. Oklahoma Anadarko area?
25. Eastern Oklahoma?
26. Pennsylvania?
27. Texas Railroad District No. 5?
28. Texas Railroad District No. 10?
29. Texas Railroad District Nos. 8, 8A, 7B and 7C?
30. Texas Railroad District Nos. 5 and 6?
31. Texas Railroad District Nos. 1, 2, 3 and 4?
32. Offshore Texas?[2]
    (*a*) Federal
    (*b*) State
33. Utah?
34. Virginia?
35. West Virginia?
36. Wyoming?
37. Miscellaneous areas?[4]

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[1] For the purpose of questions 2 and 3, Arkansas is divided between North and South by base line separating townships North and South.

[2] For the purpose of this question, the offshore area shall be measured from the coastline seaward.

[3] For the purpose of questions 23–25, Oklahoma is divided between Eastern and Western Oklahoma by the central Oklahoma Indian Meridian separating Ranges E and W. Western Oklahoma is further divided between Hugoton and Anadarko by the Panhandle Meridian separating Ranges E and W.

[4] For the purpose of this question, the Miscellaneous areas shall include Alabama, Arizona, Florida, Iowa, Maryland, Minnesota, Missouri, South Dakota, Tennessee and Washington.

38. What is the total of the volumes furnished in response to questions 1–37?

Question F. Will you please state the net working interest volumes, including royalty interest volumes, of proved recoverable reserves of associated and dissolved natural gas in MMcf, at 14.73 psia, and 60 degrees Fahrenheit, that your company had available for sale as of December 31, 1972, for the areas hereinafter designated?

What are the volumes in:

1. Alaska?
2. Northern Arkansas?[1]
3. Southern Arkansas?
4. California?
5. Offshore California?[2]
   (*a*) Federal
   (*b*) State
6. Colorado?
7. Illinois?
8. Indiana?
9. Kansas?
10. Kentucky?
11. North Louisiana?
12. South Louisiana?
13. Offshore Louisiana?[2]
    (*a*) Federal
    (*b*) State
14. Michigan?
15. Mississippi?
16. Montana?
17. Nebraska?
18. Northwest New Mexico?
19. Southeast New Mexico?
20. New York?
21. North Dakota?
22. Ohio?
23. Oklahoma Panhandle area?[3]
24. Oklahoma Anadarko area?
25. Eastern Oklahoma?
26. Pennsylvania?
27. Texas Railroad District No. 9?
28. Texas Railroad District No. 10?
29. Texas Railroad District Nos. 8, 8A, 7B and 7C?
30. Texas Railroad District Nos. 5 and 6?
31. Texas Railroad District Nos. 1, 2, 3 and 4?
32. Offshore Texas?[2]
    (*a*) Federal
    (*b*) State
33. Utah?
34. Virginia?
35. West Virginia?
36. Wyoming?
37. Miscellaneous areas?[4]
38. What is the total of the volumes furnished in response to questions 1–37?

Question G. Will you please state the *total* net working interest volumes, including royalty interest volumes, of proved recoverable reserves of non-associated and of associated and dissolved natural gas in MMcf, at 14.73 psia and 60 degree Fahrenheit, that your company had available for sale as of December 31, 1972, for the areas hereinafter designated?

What are the volumes in:

1. Alaska?

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[1] For the purpose of questions 2 and 3, Arkansas is divided between North and South by base line separating townships North and South.

[2] For the purpose of this question, the offshore area shall be measured from the coastline seaward.

[3] For the purpose of questions 23–25, Oklahoma is divided between Eastern and Western Oklahoma by the central Oklahoma Indian Meridian separating Ranges E and W. Western Oklahoma is further divided between Hugoton and Anadarko by the Panhandle Meridian separating Ranges E and W.

[4] For the purpose of this question, the Miscellaneous areas shall include Alabama, Arizona, Florida, Iowa, Maryland, Minnesota, Missouri, South Dakota, Tennessee and Washington.

2. Northern Arkansas?[1]
3. Southern Arkansas?
4. California?
5. Offshore California?[2]
    (*a*) Federal
    (*b*) State
6. Colorado?
7. Illinois?
8. Indiana?
9. Kansas?
10. Kentucky?
11. North Louisiana?
12. South Louisiana?
13. Offshore Louisiana?[2]
    (*a*) Federal
    (*b*) State
14. Michigan?
15. Mississippi?
16. Montana?
17. Nebraska?
18. Northwest New Mexico?
19. Southeast New Mexico?
20. New York?
21. North Dakota?
22. Ohio?
23. Oklahoma Panhandle area?[3]
24. Oklahoma Anadarko area?
25. Eastern Oklahoma?
26. Pennsylvania?
27. Texas Railroad District No. 9?
28. Texas Railroad District No. 10?
29. Texas Railroad District Nos. 8, 8A, 7B and 7C?
30. Texas Railroad District Nos. 5 and 6?
31. Texas Railroad District Nos. 1, 2, 3 and 4?
32. Offshore Texas?[2]
    (*a*) Federal
    (*b*) State
33. Utah?
34. Virginia?
35. West Virginia?
36. Wyoming?
37. Miscellaneous areas?[4]
38. What is the total of the volumes furnished in response to questions 1–37?

Question H. Will you please state the net working interest volumes, including royalty interest volumes, of proved recoverable reserves of non-associated natural gas in MMcf, at 14.73 psia and 60 degrees Fahrenheit, that your company had available for sale as of June 30, 1973, for the areas hereinafter designated?

What are the volumes in:

1. Alaska?
2. Northern Arkansas?[1]
3. Southern Arkansas?
4. California?
    (*a*) Federal
    (*b*) State
5. Offshore California?[2]
6. Colorado?
7. Illinois§

---

[1] For the purpose of questions 2 and 3, Arkansas is divided between North and South by base line separating townships North and South.

[2] For the purpose of this question, the offshore area shall be measured from the coastline seaward.

[3] For the purpose of questions 23–25, Oklahoma is divided between Eastern and Western Oklahoma by the central Oklahoma Indian Meridian separating Ranges E and W. Western Oklahoma is further divided between Hugoton and Anadarko by the Panhandle Meridian separating Ranges E and W.

[4] For the purpose of this question, the Miscellaneous areas shall include Alabama, Arizona, Florida, Iowa, Maryland, Minnesota, Missouri, South Dakota, Tennessee and Washington.

8. Indiana?
9. Kansas?
10. Kentucky?
11. North Louisiana?
12. South Louisiana?
13. Offshore Louisiana?[2]
    (*a*) Federal
    (*b*) State
14. Michigan?
15. Mississippi?
16. Montana?
17. Nebraska?
18. Northwest New Mexico?
19. Southeast New Mexico?
20. New York?
21. North Dakota?
22. Ohio?
23. Oklahoma Panhandle area?[3]
24. Oklahoma Anadarko area?
25. Eastern Oklahoma?
26. Pennsylvania?
27. Texas Railroad District No. 9?
28. Texas Railroad District No. 10?
29. Texas Railroad District Nos. 8, 8A, 7B and 7C?
30. Texas Railroad District Nos. 5 and 6?
31. Texas Railroad District Nos. 1, 2, 3 and 4?
32. Offshore Texas?[2]
    (*a*) Federal
    (*b*) State
33. Utah?
34. Virginia?
35. West Virginia?
36. Wyoming?
37. Miscellaneous areas?[4]
38. What is the total of the volumes furnished in response to questions 1–37?

Question. I. Will you please state the net working interest volumes, including royalty interest volumes, of proved recoverable reserves of associated and dissolved natural gas in MMcf, at 14.73 psia and 60 degree Fahrenheit, that your company had available for sale as of June 30, 1973, for the areas hereinafter designated?

What are the volumes in:

1. Alaska?
2. Northern Arkansas?[1]
3. Southern Arkansas?
4. California?
5. Offshore California?[2]
6. Colorado?
7. Illinois?
8. Indiana?
9. Kansas?

---

[1] For the purpose of questions 2 and 3, Arkansas is divided between North and South by base line separating townships North and South.

[2] For the purpose of this question, the offshore area shall be measured from the coastline seaward.

[3] For the purpose of questions 23–25, Oklahoma is divided between Eastern and Western Oklahoma by the central Oklahoma Indian Meridian separating Ranges E and W. Western Oklahoma is further divided between Hugoton and Anadarko by the Panhandle Meridian separating Ranges E and W.

[4] For the purpose of this question, the Miscellaneous areas shall include Alabama, Arizona, Florida, Iowa, Maryland, Minnesota, Missouri, South Dakota, Tennessee and Washington.

10. Kentucky?
11. North Louisiana?
12. South Louisiana?
13. Offshore Louisiana?[2]
    (a) Federal
    (b) State
14. Michigan?
15. Mississippi?
16. Montana?
17. Nebraska?
18. Northwest New Mexico?
19. Southeast New Mexico?
20. New York?
21. North Dakota?
22. Ohio?
23. Oklahoma Panhandle area?[3]
24. Oklahoma Anadarko area?
25. Eastern Oklahoma?
26. Pennsylvania?
27. Texas Railroad District No. 9?
28. Texas Railroad District No. 10?
29. Texas Railroad District Nos. 8, 8A, 7B and 7C?
30. Texas Railroad District Nos. 5 and 6?
31. Texas Railroad District Nos. 1, 2, 3 and 4?
32. Offshore Texas?[2]
    (a) Federal
    (b) State
33. Utah?
34. Virginia?
35. West Virginia?
36. Wyoming?
37. Miscellaneous areas?[4]
38. What is the total of the volumes furnished in response to questions 1–37?

Question J. Will you please state the *total* net working interest volumes, including royalty interest volumes, of proved recoverable reserves of non-associated and of associated and dissolved natural gas in MMcf, at 14.73 psia and 60 degrees Fahrenheit, that your company had available for sale as of June 30, 1973, for the areas hereinafter designated?

What are the volumes in:

1. Alaska?
2. Northern Arkansas?[1]
3. Southern Arkansas?
4. California
5. Offshore California?[2]
    (a) Federal
    (b) State
6. Colorado?
7. Illinois?
8. Indiana?

---

[1] For the purpose of questions 2 and 3, Arkansas is divided between North and South by base line separating townships North and South.

[2] For the purpose of this question, the offshore area shall be measured from the coastline seaward.

[3] For the purpose of questions 23–25, Oklahoma is divided between Eastern and Western Oklahoma by the central Oklahoma Indian Meridian separating Ranges E and W. Western Oklahoma is further divided between Hugoton and Anadarko by the Panhandle Meridian separating Ranges E and W.

[4] For the purpose of this question, the Miscellaneous areas shall include Alabama, Arizona, Florida, Iowa, Maryland, Minnesota, Missouri, South Dakota, Tennessee and Washington.

9. Kansas?
10. Kentucky?
11. North Louisiana?
12. South Louisiana?
13. Offshore Louisiana[2]
    (*a*) Federal
    (*b*) State
14. Michigan?
15. Mississippi?
16. Montana?
17. Nebraska?
18. Northwest New Mexico?
19. Southeast New Mexico?
20. New York?
21. North Dakota
22. Ohio?
23. Oklahoma Panhandle area?[3]
24. Oklahoma Anadarko area?
25. Eastern Oklahoma?
26. Pennsylvana?
27. Texas Railroad District No. 9?
28. Texas Railroad District No. 10?
29. Texas Railroad District Nos. 8, 8A, 7B and 7C?
30. Texas Railroad District Nos. 5 and 6?
31. Texas Railroad District Nos. 1, 2, 3 and 4?
32. Offshore Texas?[2]
    (*a*) Federal
    (*b*) State
33. Utah?
34. Virginia?
35. West Virginia?
36 Wyoming?
37. Miscellaneous areas?[4]
38. What is the total of the volume furnished in response to questions 1–37?

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[2] For the purpose of this question, the offshore area shall be measured from the coastline seaward.

[3] For the purpose of questions 23–25, Oklahoma is divided between Eastern and Western Oklahoma by the central Oklahoma Indian Meridian separating Ranges E and W. Western Oklahoma is further divided between Hugoton and Anadarko by the Panhandle Meridian separating Ranges E and W.

[4] For the purpose of this question, the Miscellaneous areas shall include Alabama, Arizona, Florida, Iowa, Maryland, Minnesota, Missouri, South Dakota, Tennessee and Washington.

PROVED NATURAL GAS RESERVES AVAILABLE FOR SALE[1]

[MM ft³ at 14.73 lb/in²a, 60° F.]

State	Volumes as of Dec. 31, 1972			Volumes as of June 30, 1973		
	Non-associated	Associated-dissolved	Total	Non-associated	Associated-dissolved	Total
Alaska						
Arkansas:						
Northern						
Southern						
California:						
Offshore California:						
(a) Federal						
(b) State						
Colorado						
Illinois						
Indiana						
Kansas						
Kentucky						
Louisiana:						
North						
South						
Offshore:						
(a) Federal						
(b) State						
Michigan						
Mississippi						
Montana						
Nebraska						
New Mexico:						
Northwest						
Southwest						
New York						
North Dakota						
Ohio						
Oklahoma:						
Panhandle						
Anadarko						
Eastern						
Pennsylvania						
Texas:						
RR District No. 9						
RR District No. 10						
RR District Nos. 8, 8A, 7B, 7C						
RR District Nos. 5, 6						
RR District Nos. 1, 2, 3, 4						
Offshore:						
(a) Federal						
(b) State						
Utah						
Virginia						
West Virginia						
Wyoming						
Miscellaneous						
Total						

---

[1] Proved reserves are, using the definition of the Committee on Natural Gas Reserves of the American Gas Association, as follows:

"The current estimated quantity of natural gas which analysis of geologic and engineering data demonstrate with reasonable certainty to be recoverable in the future from known oil and gas reservoirs under existing economic and operating conditions. Reservoirs are considered proved that have demonstrated the ability to produce by either actual production or conclusive formation test.

"The area of a reservoir considered proved is that portion delineated by drilling and defined by gas-oil, gas-water, or oil-water contracts or limited by structural deformation or lenticularity of the reservoir. In the absence of fluid contracts, the lowest known structural occurrence of hydrocarbons controls the proved limits of the reservoir. The proved area of a reservoir may also include the adjoining portions not delineated by drilling but which can be evaluated as economically productive on the basis of geological and engineering data available at the time the estimate is made. Therefore, the reserves reported by the committee include total proved reserves which may be in either the drilled or the undrilled portions of the field or reservoir."

FEDERAL POWER COMMISSION—ORDER TO SHOW CAUSE

(Issued July 31, 1973)

Before Commissioners: John N. Nassikas, Chairman; Albert B. Brooke, Jr., Rush Moody, Jr., and William L. Springer.

Amerada Hess Corporation, *et al.** R174–15.

On December 21, 1971, this Commission intiated the study and analysis which ultimately led to the issuance of the*National Gas Reserves Study* (1973) in May of this year by the National Gas Survey.[1] In that order, we recognized the value of having voluntary cooperation by natural gas companies in the production of proprietary reserve information and, accordingly, provided in Paragraph (B):

Any non-public commercial information concerning an individual natural gas company's reserves obtained during the course of this survey and analysis shall be treated as confidential without public disclosure by the staff of the Commission and its agents, including any acounting firm selected by the Commission to assist in this survey and analysis, unless otherwise directed by the Commission. The provisions of Section 8(b) of the Natural Gas Act [15 U.S.C. 717g(b)] and 5 U.S.C. 552(b) (4) and (9) [Freedom of Information Act] shall apply."

In our amending order of March 9, 1972, we reiterated our belief in the need for protecting the confidentiality of this reserve data, specifically noting that "the publicizing of such information would have an inhibiting effect upon future exploration for natural gas reserves since speculators could equally benefit with those companies willing to make geological and geophysical expenditures." [2]

To insure that confidentiality would be maintained in fact, we went further in those orders and established detailed procedures for the compilation and analysis of individual company reserve data. To begin with, industry representatives who provide A.G.A. reserves were to submit those reserves by fields on a confidential basis to an independent accounting agent. A list of all gas fields for which A.G.A. reserve data was submited was then to be prepared by the accounting agent and forwarded to the Oil Information Center (OIC) of the University of Oklahom Research Institute. After comparing the accounting agent's field list developed from the A.G.A. records with a list from the United States Government Interagency Oil and Gas Field Study and other government data, the OIC was to compile a complete list of gas fields in the United States with remaining recoverable reserves as of December 31, 1970.

A copy of the OIC gas field identification list and a supplemental list of "A.G.A. omitted fields" was to be forwarded to the accounting agent who, in turn, was to stratify all fields in each A.G.A. subcommittee area by size and age so that a statisticaally valid sampling procedure could be prescribed. Following the determination by a statistical validation team of the number of fields to be surveyed independently in each A.G.A. subcommittee area, the accounting agent was to make a random selection of the fields to be surveyed.

Upon receiving a list of the fields to be surveyed, independent reserve teams, under supervision by the staff of the Federal Power Commission, were to visit various natural gas companies and examine data relating to each selected field.[3] The companies were requested to furnish the reserve teams with such information as (1) field area maps showing the location and completion of all wells drilled prior to December 31, 1970, (2) electrical well surveys, (3) core analyses, (4) reservoir production histories, (5) specific gravities of gas, (6) formation temperatures, (7) original reservoir pressures, (8) isopach maps, (9) records and backup data on reservoir pressure measurements, and (10) other pertinent data requested by the reserve teams. After analyzing such data, the independent reserve teams were to transmit their estimations on a confidential basis to the reserve team supervisor who, in turn, was to furnish the accounting agent with a final reserve estimate for each field after comparing the reserve team data with A.G.A. reserve estimates or any other source.[4] The worksheets which were prepared by the reserve teams were to be returned to the Commission's offices in Washington and placed in the custody of the Technical Director of the National Gas Survey who was to have the responsibility of protecting their confidentiality.

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*See Appendix A.

[1] Order Directing Study and Analysis of Natural Gas Reserves and Prescribing Procedures for the National Gas Survey (December 21, 1971).

[2] Order Amending Order Prescribing Procedures for the National Gas Survey (March 9, 1972).

[3] Reserves in selected fields lying in the Outer Continental Shelf, offshore Louisiana, were examined and estimated by the United States Geological Survey. The Office of Naval Petroleum and Oil Shale Reserves were also instrumental in the estimation of certain state land field reserves.

[4] A.G.A. reserves estimates for the fields surveyed were made available to Mr. Lawrence R. Mangen, supervisor of the reserve teams.

Once all sampling had been completed and all final estimates submitted, the independent accounting agent was to provide a report to the National Gas Survey on United States gas reserves as of December 31, 1970. When the report was accepted by the National Gas Survey, the accounting agent and the reserve team supervisor were to return all A.G.A. records to the member of the A.G.A. Committee of Natural Gas Reserves assigned to the particular area involved.

All of these procedures have been implemented in the compilation and analysis of the reserves which are reported in the *National Gas Reserves Study*. We must now address ourselves to the proper disposition of the confidential data now in the possession of the Technical Director of the National Gas Survey who has been directed to retain custody until further order. We are particularly concerned with internal records and worksheets which contain detailed information of each reservoir examined, including the reservoir's (1) principal sellers and operators, (2) size and location, (3) number of productive areas, (4) porosity (5) initial and current pressures, (6) depth, (7) basic lithology, and (8) remaining recoverable reserves. Furthermore, we must determine whether the National Gas Survey should formally accept the accounting agent's report, thereby permitting the accounting agent and the reserve team supervisor to release all A.G.A records to an appropriate member of the A.G.A. Committee on Natural Gas Reserves. As we have indicated, the accounting agent has a complete list of A.G.A. individual field reserve estimates, while the reserve team supervisor possesses A.G.A. reserve estimates only as to those selected fields actually surveyed.

At the outset, it should be made clear that this Commission intends to comply to the fullest extent possible with all assurances of confidentiality. However, our discretion may be limited to the demands of certain Congressional committees and subcommittees which are independently investigating the energy crisis.[5] Already, the Chairman of the Commission has been compelled by *subpoena duces tecum* to furnish uncommitted gas reserve data to the Senate Judiciary Committee's Subcommittee on Antitrust and Monopoly.[6] Under compulsion of process, we authorized the Chairman to comply with the subcommittee's demands, but expressly noted the Constitutional and statutory infirmities inherent in such a procedure:

"* * * [T]he procedural and substantive due process rights of citizens of the United States are placed in jeopardy. The time constraint imposed by the Subcommittee precludes any meaningful notice to those whose property rights are being affected, and any real opportunity on their part to be heard prior to the entry of this order and prior to the disclosure now demanded by the Subcommittee."[7]

In order to avoid any further encroachment upon the procedural and substantive rights of those whose property is involved without their opportunity to defend such property, we are hereby initiating a proceeding to determine what action, if any, shoudl be taken regarding disclosure of the reserve data upon which the *National Gas Reserves Study* is based. Specifically, we invite not only the natural gas companies listed in Appendix A, but indeed all interested parties, to show cause why all or a portion of the reserve data in question should either be (1) retained on a confidential basis, (2) disclosed to the public in general, (3) disclosed only to Congressional committees and subcommittees, without restriction, (4) disclosed only to Congressional committees or subcommittees but subject to confidential treatment, (5) disclosed to other Federal agencies without restriction, or (6) disclosed to other Federal agencies but subject to confidential treatment.

Each party responding to this proceeding should explain in detail the reasons in support of its position. In particular, respondents are requested to comment on the following questions:

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[5] The staff of the Federal Trade Commission has also expressed an interest in obtaining a portion of the reserve data to be used in conjunction with its investigation styled *In the Matter of the American Gas Association*, File No. 721 0042.

[6] On June 21, 1973, Senator Philip A. Hart, acting on behalf of the subcommittee, issued a *subpoena duces tecum* demanding production of virtually all documents whatsoever relating to the updated nationwide investigation in Docket No. R–405.

[7] Order of June 22, 1973, in Docket No. R–405; Cf. *Accardi* v. *Shaughnessy*, 347 U.S. 260 (1954); *Service* v. *Dulles*, 354 U.S. 363 (1957).

1. Would disclosure of the detailed reserve data to the public, other Federal agencies, or any committee or subcommittee of Congress be inimical to competition? If so, to what extent?

2. Would disclosure of the detailed reserve data to the public, other Federal agencies, or any committee or subcommittee of Congress inhibit future exploration and development for new gas reserves?

3. Would disclosure of the detailed reserve data to the public, other Federal agencies, or any committee or subcommittee of Congress cause economic harm to the companies whose reserves are involved?

4. Would disclosure of the detailed reserve data to the public, other Federal agenices, or any committee or subcommittee of Congress place sellers of natural gas in an unfair position to negotiate with potential buyers?

5. Is any of the reserve data underlying the *National Gas Reserves Study* available from any other source to the public, other Federal agencies, or any committee or subcommittee of Congress? If, so, to what extent?

6. Has any natural gas company whose data is involved provided the same or similar information to any other agency or any committee or subcommittee of Congress. If so, under what circumstances?

7. Are there any other public policy reasons why such data should not be disclosed to the public, other Federal agencies, or any committee or subcommittee of Congress?

In the last analysis, it is the desire of this Commission to comply with all lawful requests of Congress without violating either the terms of our orders or the provisions of the Natural Gas Act, and without breaching the trust of those who have relied upon our assurances of confidentiality. Hopefully, through the cooperation of all concerned, a proper balance will be reached between all legitimate areas of public and private concern.

All responses to this order shall be in writing and shall be filed on or before August 15 ,1973. Any definitive order hereinafter entered regarding disclosure of the data in question shall be deemed by this Commission to be final and reviewable by a court of competent jurisdiction.

The Commission finds:

It is in the public interest and required by due process that all interested parties, particularly those listed in Appendix A, be given an opportunity to show cause why the gas reserve data compiled and analyzed for the *National Gas Reserves Study* (1973) should be either retained on a confidential basis, publicly disclosed, disclosed to any committee or subcommittee of Congress without restriction, disclosed to any committee or subcommittee of Congress subject to confidential treatment, disclosed to other Federal agencies without restriction, or disclosed to the Federal agencies subject to confidentiality.

The Commission orders:

(1) All interested parties, particularly those listed in Appendix A, are invited to show cause why the gas reserve data described above should either be retained on a confidential basis, publicly disclosed, disclosed to any committee or subcommittee of Congress without restriction, disclosed to any committee or subcommittee of Congress subject to confidential treatment, disclosed to other Federal agencies without restriction, or disclosed to other Federal agencies subject to confidentiality.

(2) All responses shall be in writing and shall be filed on or before August 15, 1973.

By the Commission.

MARY B. KIDD, *Acting Secretary.*

Appendix A

The natural gas companies who should respond to this order are as follows:

Amerada Hess Corporation
Arkansas Louisiana Gas Company
Atlantic Richfield Company
Austral Oil Company, Inc.
Champlin Petroleum Company
Cities Service Company
Continental Oil Company
Consolidated Gas Supply Corporation
El Paso Natural Gas Company
General Crude Oil Company

Getty Oil Company
Gulf Oil Corporation
Exxon Company, U.S.A.
Kentucky-West Virginia Gas Company
Kerr-McGee Corporation
Lone Star Gas Corporation
Marathon Oil Company
Mitchell Energy and Development Corporation
Michigan Wisconsin Pipe Line Company
Mobil Oil Corporation
Montana-Dakota Utilities Company
Murphy Oil Corporation
Natural Gas Pipeline Company of American
Northern Natural Gas Company
Panhandle Eastern Pipe Line Company
Pennzoil United, Inc.
Phillips Petroleum Company
Shell Oil and Gas Company
Signal Oil and Gas Company
Skelly Oil Company
Southern Natural Gas Company
Standard Oil Company of Indiana (Amoco)
Standard Oil Company of California (Chevron)
Sun Oil Company
The Superior Oil Company
Tenneco Inc.
Texaco Inc.
Texas Pacific Oil Company, Inc.
Union Oil Company of California

United States Court of Appeals for the District of Columbia Circuit

No. 71–1560

TEXACO, INC., PETITIONER

v.

FEDERAL POWER COMMISSION, RESPONDENT

MRS. JAMES R. DOUGHERTY, ET AL, INTERVENORS

No. 71–1561

CONSOLIDATED GAS SUPPLY CORPORATION, PETITIONER

v.

FEDERAL POWER COMMISSION, RESPONDENT

MRS. JAMES R. DOUGHERTY, ET AL, INTERVENORS

No. 71–1603

JAMES M. FORGOTSON, SR.

AN INDEPENDENT NATURAL GAS PRODUCER, PETITIONER

v.

FEDERAL POWER COMMISSION, RESPONDENT

MRS. JAMES R. DOUGHERTY, ET AL

TEXACO, INC., INTERVENORS

No. 71–1612

Public Service Commission of the State of New York, petitioner

v.

Federal Power Commission, respondent

Texaco, Inc., intervenor

No. 71–1627

Independent Natural Gas Association of America, petitioner

v.

Federal Power Commission, respondent

No. 71–1647

Warren Petroleum Corporation, petitioner

v.

Federal Power Commission, respondent

No. 71–1722

Tennessee Gas Pipeline Company, A Division of Tenneco, Inc., petitioner

v.

Federal Power Commission, respondent

No. 71-1727

Phillips Petroleum Company, petitioner

v.

Federal Power Commission, respondent

Texaco, Inc, intervenor

No. 71–1729

Texaco, Inc., petitioner

v.

Federal Power Commission, respondent

petition for review of an order of the federal power commission

Decided December 12, 1972

Mr. Richard A. Solomon, with whom *Messrs. Peter H. Schiff* and *Saul W. Baernstein* were on the brief, for petitioner in No. 71-1612.

Mr. Christopher T. Boland, with whom *Messrs. Robert G. Hardy* and *Jerome J. McGrath* were on the brief, for petitioner in No. 71-1627, also argued for petitioners in No. 71-1561 and 71-1722.

Mr. John T. Ketcham, with whom *Messrs. Kenneth Heady, Warren M. Sparks, Charles E. McGee* and *Robert J. Haggerty* were on the brief, for petitioner in No. 71-1647 and 71-1727 also argued for petitioners in Nos. 71-1560 and 71-1729.

Mr. Michael J. Manning, Attorney, Federal Power Commission for respondent. *Messrs. Gordon Gooch*, General Counsel, Federal Power Commission, *Leo E. Forquer*, Solicitor and *George W. McHenry, Jr.*, First Assistant Solicitor, Federal Power Commission were on the brief, for respondent. *Mr. J. Richard Tiano*, First Assistant Solicitor, Federal Power Commission at the time the record was filed, also entered an appearance for respondent.

Mr. Benjamin F. Vaughan, III, with whom *Mr. R. James George, Jr.*, was on the brief, for intervenors Mrs. James R. Dougherty, et al.

Messrs. J. Donald Annett and *Kirk W. Weinert* were on the brief for petitioners in No. 71-1560 and No. 71-1729 and Intervenor, Texaco, Inc.

Messrs. Norman A. Flaningam, Charles R. Brown, and *Richard J. Connor,* were on the brief, for petitioners in No. 71-1561 .

Mr. Edward H. Forgotson, was on the brief, for petitioners in No. 71-1603.

Messrs. Melvin Richter, Dale A. Wright, and *Harry S. Welch* were on the brief, for petitioner in No. 71-1722.

Messrs. L. Dan Jones and *William I. Powell* filed a brief on behalf of the Independent Petroleum Association of America, as *amicus curiae* urging affirmance.

Messrs. Philip R. Ehrenkranz and *Clyde O. Martz* filed a brief on behalf of Anderson Oil Company, et al and Hickerson Oil Company, et al *amici curiae* urging affirmance.

Before Fahey, *Senior Circuit Judge,* Robinson and Wilkey, *Circuit Judges.*

Opinion by Circuit Judge Wilkey.

Dissenting opinion by Senior Circuit Judge Fahy at p. 18.

Wilkey, *Circuit Judge*: Petitioners seek review of orders of the Federal Power Commission[1] in Docket No. R–393, a rulemaking proceeding instituted by a Notice[2] entitled "Exemption of Small Producers From Regulation."[3] These orders exempted all existing and future sales by "small producers"[4] from direct rate regulation. Small producers could, thereunder, contract for the sale of their gas at any obtainable rates. The Commission proposed indirectly to control such rates by regulating, under standards set forth in the orders, the costs allowed to be incorporated in the rates of large producers and pipelines on resale of gas which originated with small producers. Even if resale rates were found excessive because the cost of small producer gas was "unreasonably high," small producers would be under no duty to refund the absorbed excess to the large producers and pipelines. Since we conclude that the Commission exceeded its authority under the Natural Gas Act, the orders in Docket No. R–393 must be set aside.

I. The Ends

Our conclusion herein challenges neither the Commission's motives nor its opinion that some form of deregulation of small producers might benefit the consumers of natural gas. The orders represent an imaginative attempt to deal with problems of enormous magnitude. A critical gas shortage, which has been judicially recognized,[5] faces the nation. The Federal Power Commission is confronted with an ever-increasing regulatory burden—and limited resources. These combine to produce administrative delay and threaten the Commission's ability adequately to control natural gas prices.

Since small gas producers have historically accounted for as much as 80% of new exploration, but have less ready access to the necessary capital than do large producers, after thorough study the Commission concluded that generally beneficial exploration activity would be encouraged by assuring stable revenue flows to small producers. From deregulation of small producers, realization of their full contract prices at market levels would become a certainty. Since the small producers only account for 10.5% of the gas put into pipelines, the FPC felt that any cost hike resulting from deregulation would have a minimal effect on consumers. Obviously, any step towards deregulation would lessen the Commission's administrative load.

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[1] The Commission's original Order No. 428 was issued on 18 March 1971. It was subsequently modified by Order No. 428–A, issued 9 April 1971, and Order No. 428–B, issued 15 July 1971.

[2] Issued 23 July 1970. It should be noted that some of the petitioners challenge the sufficiency of that notice. Since all important objections were raised and considered prior to the action of the Commission in Order No. 428–B, we do not agree that further publication is required by the Administrative Procedure Act. In any event, given our disposition of these cases, that issue need not be reached.

[3] Joint Appendix (hereafter "J.A.") at 1. The resulting Order 428 was entitled "Order Establishing Blanket Certificate Procedure For Small Producer Sales and Providing Relief From Detailed Filing Requirements." As this opinion will explain, the actual terms of this order belie its title's suggestion that its effect is more limited than that implied by the broad title of the Notice of Proposed Rulemaking.

[4] Small producers are defined as those with jurisdictional sales of less than 10,000,000 Mcf of gas per year. Such producers would be required to submit annually a document setting forth pertinent information concerning their jurisdictional sales.

[5] See *Southern Louisiana Area Rate Cases* v. *FPC,* 428 F. 2d 407, 437 (5th Cir. 1970), *cert. denied,* 400 U.S. 950.

This court also recognizes that the Commission was engaged, in good faith, in what it felt was a valid extrapolation from judicial comments as to which solutions to these problems would be acceptable. In *FPC* v. *Hunt*, Justice Clark made the following suggestion for dealing with the Commission's docket congestion:

> [T]he techniques of the National Labor Relations Board might be studied with a view to determining whether its exemption practices . . . might be helpful in the solution of the Commission's problems.[6]

In more recent cases, this court has explicitly encouraged experimentation to meet the threat of a gas shortage.[7] Given traditional judicial deference to the agency's expertise, the FPC obviously concluded that it would be allowed to embark upon, and later evaluate, an experimental approach to achieving the purposes of the Natural Gas Act.

II. The Means

However, Congress has prescribed limits on the Commission's authority. The others considered here can be upheld only if they comply with the specific provisions of the Natural Gas Act. The Commission may, of course, classify different types of producers, alter some filing requirements, and "make other pragmatic adjustments which may be called for by particular circumstances." [8] However, the FPC must act "within the ambit of [its] . . . statutory authority." [9] The Commission may not ignore the command of Section 4 (15 U.S.C. § 717(c)(a):

> *All* rates and charges made, demanded, or received by *any* natural-gas company for or in connection with the . . . sale of natural gas subject to the jurisdiction of the Commission . . . shall be just and reasonable, and *any* such rate or charge that is not just and reasonable is hereby declared to be unlawful. [Emphasis added.] [10]

The Commission must also heed similar language in Section 5 (15 U.S.C. § 717(d)):

> Whenever the Commission, after a hearing had upon . . . complaint of any State, municipality, State Commission, or gas distributing company, shall find that *any* rate, charge or classification demanded, observed, charged, or collected by *any* natural-gas company in connection with *any* . . . sale of natural gas, subject to the jurisdiction of the commission . . . is unjust, unreasonable, unduly discriminatory, or preferential, the Commission *shall* determine the just and reasonable rate, charge, classification . . . or contract to be thereafter observed and in force, and *shall* fix the same by order . . . [Emphasis added.]

Ever since *Phillips Petroleum Co.* v. *Wisconsin*, the Commission, even against its own will, has had a judicially recognized duty to assume "jurisdiction over the rates of *all* wholesales of natural gas in interstate commerce" [11] to insure that all such rates comply with the statutory standard.

A.

We cannot accept the Commission's argument that it may shirk this duty. To the extent that the Commission argues that Justice Clark's dicta in *Hunt* imply that exemption of a class of producers from the statutory standard would be permissible, we note that reliance cannot be placed on the NLRB as a model. The National Labor Relations Act specifically permits the Labor Board to decline to exercise its own jurisdiction.[12] In contrast, as evidenced by *Phillips*, the Natural Gas Act does not give the Commission any such power. Only this year the Supreme Court specifically contrasted the FPC and the NLRB, suggesting that the former's jurisdiction will be broadly construed so that there are no "gaps" in the Natural Gas Act's "comprehensive and effective regulatory scheme." [13] Further, the trials and experimentations which this court has previously approved have always been trials of new procedures consistent with the terms of the Natural Gas Act, not experimental attempts to amend, avoid or ignore these provisions.[14]

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[6] 376 U.S. 515, 527 (1964).

[7] *Public Service Commission* v. *FPC*, —— U.S. App. D.C. ——, —— F. 2d —— (No. 71–1161, decided 29 March 1972, slip op. at 12) (*rehearing denied* 19 May 1972); *Public Service Commission* v. *FPC*, —— U.S. App. D.C. ——, —— F. 2d —— (Nos. 71–1197, *et al.*, decided 16 May 1972), slip op. at 9.

[8] *Federal Power Commission* v. *Natural Gas Pipeline Co.*, 315 U.S. 575, 586 (1942).

[9] *FPC* v. *Natural Gas Pipeline Co.*, *supra*.

[10] The Supreme Court has described "the fixing of 'just and reasonable' rates" as "the heart of the new regulatory system." *FPC* v. *Hope Natural Gas Co.*, 320 U.S. 591, 611 (1944).

[11] 347 U.S. 672, 682 (1954). (Emphasis added.) It should be noted that Justice Clark, in dissent, conceded that "[o]n its face, this language brings every gas operator, *from the smallest producer to the largest pipeline*, under federal regulatory control." 347 U.S. 672, 691 (emphasis added).

[12] 29 U.S.C. 160(a).

The Commission relies heavily on *Permian Basin Area Rate Cases* [15] to support the proposition that it may exempt small producers from certain requirements. However, the "exemptions" approved there were from detailed filing requirements, not from all regulation. The Court in *Permian* specifically noted that "the exemptions created by the Commission" were "fully consistent with the *terms* and purposes of its statutory responsibilities." [16]

Thus the Commission's power, under Section 16 of the Natural Gas Act, to "classify persons and matters within its jurisdiction" and to "prescribe different requirements for different classes" cannot validate this exemption of small producers. The Commission can only classify "[f]or the purposes of its rules and regulations." It can only prescribe rules and regulations "to carry out the provisions of this chapter." Section 16 thus does not give the Commission independent powers. Rather, it provides for implementation of the core sections of the Act, such as Section 4.

B.

Nor can we accept the Commission's argument that it has met its obligation to insure the statutory standard of "just and reasonable" rates by indirectly controlling small producers prices through regulation of large producers and pipelines. That argument might have some merit if the Commission had provided that small producer rates could only be passed along on resale as legitimate costs if they met the "just and reasonable" standard.[17] In essence, that is what the Commission was allowed to do in *Permian*. There, specific and direct regulation of small producer rates was held unnecessary because all such rates were required to be below the area ceiling rate—a rate level already determined by the Commission to be "just and reasonable." [18]

Here, however, the Commission set forth a different sort of guideline for its indirect regulation. The novel tests proposed are nowhere spelled out in the Act or in any decision applying the Act. Small producer rates can only be passed along to consumers if they are not unreasonably high, considering appropriate comparisons with *highest contract prices* for sales by large producers *or* the prevailing market price for *intrastate* sales in the same producing areas.[19]

Whether or not these two factors would establish precise boundaries on acceptable rates, the Commission has clearly tied its determination to factors which it does not regulate or which derive solely from market forces.[20] Large producers can, of course, *contract* for *any* prices, presumably in the hope that such payments may eventually be allowed under the regulatory scheme as legitimate costs actually incurred. *Intrastate* sale prices are at no point subject to regulation by the Commission.

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[13] *FPC* v. *Louisiana Power & Light Co.*, 406 U.S. 621, 631 (1972).

[14] Deregulation is decidedly not one of the "policy decisions of the type [the FPC] . . . was created to make." See *Public Service Commission* v. *FPC* (No. 71–1161), *supra*.

[15] 390 U.S. 747 (1968).

[16] *Id.* at 787. (Emphasis added.)

[17] However, in that event, we might have greater problems with the validity of subjecting the pipelines and large producers, who have made *unrefundable* payments to small producers, to the risk of *later* Commission determination, under such an imprecise standard, that the rates paid could not be passed along as legitimate costs. The Commission itself, in Order No. 428–B, recognized that it would be desirable for "the pipelines to know in advance the boundaries within which they could freely contract with small producers." J.A. at 246. Unfortunately, in the case at bar, the Commission chose a "more concrete guide" with no relation to the mandatory statutory standard.

Judge Fahy has suggested modification of the Order to strike its provisions prohibiting refunds from small producers and to leave open the Commission's authority to protect large producers and pipelines from unreasonably high small producer prices. That approach would only compound the uncertainty and risk for all concerned. Moreover, it would defeat the basic purpose of the Order—encouraging exploration by assuring small producers of a steady flow of funds under their contract rates.

[18] When the Commission says on pages 16 and 17 in its brief that the only difference in its new scheme from that which the Supreme Court approved in *Permian* in 1968 is that now the small producers are allowed to exceed the area rate ceiling determined to be just and reasonable, then of course the Commission is saying that the whole issue in the lawsuit is no different from *Permian*. That just isn't so. The absence of such a "just and reasonable" limit *is* the big difference. Order No. 428 not only allows small producers to exceed the reasonable and just area rate ceilings—it allows them to do so on the basis of the free market, which is the antithesis of regulation.

[19] J.A. at 142. These standards apply to both pipelines and large producers. In addition, large producers may reflect their increased payments in rate increases only if the contract price differential between their purchase and resale prices is "consistent with prevailing price differentials in the area." J.A. at 140.

The Commission has a duty to insure that all rates are "just and reasonable."[21] At best, the indirect controls it has proposed will insure that the small producer rates which are passed on to consumers are below levels set by private contracting parties (or potentially by state regulation which is not necessarily tied to the federal standard). Nothing at all insures that those levels will be "just" or "reasonable." That is the essential flaw in the Commission's plan. That is the point at which the FPC abdicates its regulatory responsibility in derogation of the purposes and mandatory terms of the statute. Indirect "regulation" by such novel "standards" is worst than an exemption simpliciter. Such an approach retains the false illusion that a government agency is keeping watch over rates, pursuant to the statute's mandate, when it is in fact doing no such thing.

One variant of the "indirect regulation" argument might contend that, while the *Commission* would no longer be regulating rates, the *market mechanism* itself would (in effect, dictate, small producer prices which were "just and reasonable." However, though ingenious on a semantic level, that argument ignores the essential difference between a regulated and an unregulated industry. Put simply, the latter is governed by the market while the former, by definition, is the subject of active governmental control.

More importantly, such a post hoc rationalization does not coincide with the Commission's own view of its Order. The FPC flatly concedes that "[t]he Commission's order does not purport to determine the just and reasonable rates for sales by small producers."[22] To the contrary, the Commission's basic contention all along has been that the "just and reasonable" standard was not mandatory and that the FPC can simply choose not to regulate rates.[23] It strains credulity to assert that the Commission meant to achieve just and reasonable rates through normal market forces while in the very same Orders it refused to let pipelines and large producer plant operators pass on these "just and reasonable" rates without further review under new non-statutory standards. Since the Commission itself has not been confident enough to conclude that the market will necessarily yield rates that comply with the statute, this court can hardly uphold the Orders on that ground.

Our dissenting colleague believes that "[t]he Commission has made a judgment which I think is within the ambit of its competence and expertise not to require small producers to be bound to the area rate . . ., on an experimental basis." (P. 20) But the "area rates" are the previously Commission-determined "just and reasonable" rates, from which, no matter how one phrases it, the small producers will be exempt, even though on an experimental basis. It is significant that the Notice for this rulemaking proceeding was frankly titled "*Exemption* of Small Producers from Regulation." Our dissenting colleague correctly notes that the Order which issued carried the title "Order Establishing Blanket Certificate Procedure for Small Producer Sales and Providing Relief from Detailed Filing Requirements." This rose by another name carries the same thorns.

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[20] In the different context of individual ratemaking proceedings, this court has insisted that the Commission's determinations be "anchored" to factors with some meaningful relationship to what is "just and reasonable." See *City of Chicago* v. *FPC,* —— U.S. App. D.C. ——, 458 F.2d 731, 750 (1971), *cert. denied,* 405 U.S. 1074 (17 April 1972) : and *City of Detroit* v. *FPC,* 97 U.S. App. D.C. 260, 230 F.2d 810 (1955), *cert. denied,* 352 U.S. 829 (1956). As the court noted in *City of Detroit,* a new Commission approach to regulation is not invalid merely because it departs from the traditional rate-base or cost-of-service methods. However, even granting the legitimacy of indirectly regulating small producer rates, the standards set forth in Order No. 428 have not been demonstrated to have any relationship at all to the statutory standard.

[21] To the extent that new sales are covered by the blanket small producer certificates, the Commission has also abandoned any attempt to scrutinize the rates involved in such sales against Section 7's standard of "public convenience and necessity." Were that the only effect of Order 428, we might have a different case. If there remained a potential for future review under the standards of Sections 4 and 5, the "public convenience and necessity" might indeed be served by temporarily allowing certification of rates meeting the novel standards proposed by the FPC. Indeed, rates are "not . . . the only factor bearing on the public convenience and necessity." *Atlantic Refining Co.* v. *Public Service Commission,* 360 U.S. 378, 391 (1959). Unlike the situation in *Atlantic Refining,* small producer rates would probably not set a pattern for the whole industry. However, the Commission here abandoned *any* future rate review under the "just and reasonable" standard. In its more recent rulemaking Orders Nos. 455 and 455–A, the Commission seems to have admitted that it has no such power. Those Orders, consolidating the Section 4 and Section 7 tests in an optional certificate procedure for new gas sales, also sought to assure producers of certain receipt of their certified contract rates. In that context, the Commission conceded that "[w]e cannot bind a future Commission not to invoke the prospective operation of Section 5, nor do we attempt to do so." Mimeo, pp. 9–10. In marked contrast is the Commission's statement regarding Order No. 428: "We seek to assure the small producer that when he enters into a new contract for the interstate sale of gas, the provisions of his contract will not be subject to change." We conclude that Order No. 455 contains the more correct view of the statutory limits on the Commission's power.

[22] Commission's Brief at p. 35.

[23] Joint Appendix at p. 136.

Judge Fahy notes that the Commission intends to review the results of its experiment. Presumably, if that review showed unjust and unreasonable rates developing, the Commission would consider reinstating the regulatory scheme. However, even if it did so, the rates charged during the interim period would not have been subject to regulation. It seems most unlikely that any "further action to protect consumers" could legally reimburse those who made payments, valid under the Commission's own rules during that experimental period, were we to approve these rules here.

The Commission further defended its decision on the grounds that, given their limited percentage of the market, a rise in small producer prices will have no great effect on consumers.[24] We doubt that the effect of potentially allowing greater than area ceiling rates for 10.5% of the gas sold can be considered *de minimis*. In any case, the long-range impact of these orders on consumers lies more in the principle they establish than in any immediate effect on prices. We think it undeniable that the Commission could, under its theory of this case, proceed to establish another class of "medium" producers, and provide the same or different appropriate exemptions for this new class, and Commission counsel so conceded in oral argument. Likewise, the Commission could, again by its own fiat, change the definition of small producer to include those with greater volumes of jurisdictional sales.

If Order No. 428 is upheld, no limit appears which could halt gradual erosion of the statutory standard's applicability. Given the Commission's self-professed distaste for regulation, a decision upholding its approach here might soon yield further FPC decisions which made the instances where rates were determined by the "just and reasonable" standard the exception rather than the rule.

Whatever the wisdom of the policy at this critical juncture of our national energy source problems, we cannot hold that *non*regulation is the statutory equivalent of regulation. Only Congress can knowingly prescribe nonregulation for small producers in lieu of the existing statutory scheme of regulation found by the Supreme Court in *Phillips* to be mandatory under the Natural Gas Act for all producers.

III. Means to the Desired End

All of this is not to say that a proper regulatory determination, within the letter and spirit of the Natural Gas Act, could not set a just and reasonable rate for small producers higher than that for large producers. Given the special problems and practices of small producers, such a result is certainly conceivable. But the small producers cannot be exempted from the regulatory scheme, and have their prices tied to the free market, by administrative agency fiat.

Nor is the scheme saved by the laudable purpose of the Commission, described by our dissenting colleague: "The Commission is attempting to learn whether under this program the small producers, relieved of much of the burden of regulation required of other classifications, can improve their exploratory efforts while charging rates which on review will nevertheless prove to be just and reasonable and which will not adversely affect the consumer interests protected by the Act." (P. 20) With all due respect to Judge Fahy and the Commission, what it is doing is experimenting to see if, after all, *non*-regulation of the small producers, letting market forces shape the price structure, will not in the long run be better both for industry and consumer. Whether this be so or not, the place for authorizing such experiments outside the present language of the Act is in Congress.[25] And, as noted immediately above in Part II, the means adopted by the

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[24] A *de minimis* effect on consumer prices seemed to weigh with the Court in *Permian* with regard to one of the approved "exceptions." 390 U.S. 747, 786–87, n. 56, and accompanying text (1968).

[25] The Congress could itself classify small producers, exempt them from regulation for a designated period of time, and meanwhile order the Commission to gather empirical data to see if this is beneficial to the industry and to consumers of natural gas. While we do not reach the details of the Commission's plan here, we should note that the different parties pointed out various inequities, each from its own point of view. The Commission might be well advised to make certain refinements in its overall plan before recommending it to Congress. In particular, the standards to be applied to resale by non-exempt producers and pipelines would benefit from greater precision—so that these businesses could know in advance what their position would ultimately be and would not have to rely on the good will of the Commission for their economic salvation.

Commission here are capable of being employed to the complete subversion of the regulatory scheme.

The Power Commission has made a conscientious and intelligent effort to cope with an enormous national problem. Where the Commission has failed is not in its diligence and its expertise. It has simply failed because the methods adopted do not square with its duties under the Natural Gas Act. This court's role, in regard to the actions of regulatory commissions, is to insure that such bodies comply with applicable legislation. The Commission's imagination and ingenuity here simply out ran the statute. The place to bring these resources to bear is in Congress. If exemption is advisable, and the Commission appears to have made a powerful case that it is, Congress should have a receptive ear. In the interim, this court cannot ignore the statute or excuse the Commission from its duty.

Accordingly, the orders of the Commission in Docket No. R–393 are set aside.

So Ordered.

Fahy, *Senior Circuit Judge, dissenting:* I agree with the court that all rates and charges of any natural-gas company subject to the jurisdiction of the Natural Gas Act, which includes the small producers here involved, shall be just and reasonable and, if not, that they are unlawful. But we have no particular rate or charge before us for scrutiny as to its justness or reasonableness. Order No. 428 of the Commission, before us for review, was made in a rule-making proceeding duly conducted. It passed upon no particular rate or charge of any or all small producers. It laid down certain guides within which small producers may contract for sales of their gas. It is properly entitled by the Commission as an "Order Establishing Blanket Certificate Procedure for Small Producer Sales and Providing Relief from Detailed Filing Requirements." The Commission explicitly relies upon the Supreme Court decision in *Permian Basin Area Rate Cases*, 390 U.S. 747 (1968), to the effect that under section 16 of the Act,[1] for purposes of its rules and regulations, the Commission may "classify persons and matters within its jurisdiction and prescribe different requirements for different classes of persons or matters." It cannot be questioned that it is within the power of the Commission separately to classify small producers.[2] The question really is whether the rules or regulations applied to this classified group are within the Act. More precisely, as it seems to me, the question is whether we can hold, on the record before us, that the type of regulation of prices adopted by the Commission has led or will lead inevitably to unjust or unreasonable rates charged by small producers to purchasers of gas from them, notwithstanding

> [a] presumption of validity . . . attaches to each exercise of the Commission's expertise, and those who would overturn the Commission's judgment undertake "the heavy burden of making a convincing showing that it is invalid because it is unjust and unreasonable in its consequences" . . . .
> . . . [I]t must be free, within the limitations imposed by pertinent constitutional and statutory commands, to devise methods of regulation capable of equitably reconciling diverse and conflicting interests.

Permian, supra, 390 U.S. at 767.

The Commission has made a judgment which I think is within the ambit of its competence and expertise[3] not to require small producers to be bound to the area rate and certain filing requirements, on an experimental basis.[4] A higher rate than that previously fixed for the industry in the area may be just and reasonable for the small producer as a separate classification within the area. The Commission is attempting to learn whether under this program the small producers, relieved of much of the burden of regulation required of other classifications, can improve their exploratory efforts while charging rates which on review will nevertheless prove to be just and reasonable, and which will not adversely affect the consumer interests protected by the Act. The Order provides:

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[1] 15 U.S.C. § 717(o) (1970).

[2] *Permian, supra,* 390 U.S. at 787, where the Supreme Court stated:

"The problems and public functions of the small producers differ sufficiently to permit their separate classification, and the exemptions created by the Commission for them are fully consistent with the terms and purposes of its statutory responsibilities. It is not without relevance that this Court has previously expressed the belief that similar arrangements would ameliorate the Commission's administrative difficulties."

[3] Recently, in *FPC* v. *Louisiana Power and Light Co.*, 406 U.S. 621, 642 (1972) the Court referred to the Commission's authority under section 16 of the Act as follows:

"[T]he Commission must possess broad powers to devise effective means to meet these responsibilities. FPC and other agencies created to protect the public interest must be free, 'within the ambit of their statutory authority, to make pragmatic adjustments which may be called for by particular circumstances.' . . . Section 16 of the Act assures the FPC the necessary degree of flexibility. . . . In applying this section, we have held that 'the width of administrative authority must be measured in part by the purposes for which it was conferred. . . . Surely the Commission's broad responsibilities therefore demand a generous construction of its statutory authority.' "

[4] The Court is not bound by Commission counsel's response during argument that the Commission could establish a class of "medium" producers for regulation similar to that which Order No. 428 applies to small producers.

We intend to review the prices established in new contracts or contract amendments relating to sales by small producers to assure the reasonableness of the rates charged by such producers pursuant to the action we are taking herein. In the event we determine that this approach is inimical to the interests of consumers, we shall take further action to protect consumers.

The Commission is attempting "to reach an accommodation of conflicting interests, through experimentation, that will result in the proper alleviation of the gas shortage." *Public Service Commission of the State of New York* v. *FPC*, —— U.S. App. D.C. ——, —— F. 2d —— (1972).

I do not think the Commission has abdicated its responsibility to insure that rates of small producers will be just and reasonable. It does not appear from the record before us that any such price that might be charged is necessarily unjust or unreasonable. It is the Commission's assumption, given the small percentage of gas sales the small producers account for, and given their situation within the industry, that the rates to be collected from their sales of gas under this new plan will in fact be just and reasonable. The record before us does not rebut this assumption. Moreover, consumer protection is promised, and I cannot now hold that the promise will not be fulfilled. The Commission states:

> The action taken here in our view does not constitute deregulation of sales by small producers. We will continue to regulate such sales but will do so at the pipeline level by reviewing the purchased gas costs of each pipeline with respect to small producer sales. We shall also provide certain other safeguards against unreasonably high small producer prices, as hereinafter discussed, to assure adequate protection of the consumer.

I have considered the contention that Order No. 428 discriminates against large producers vis-a-vis pipelines, but I find in this, as in other contentions made, no reason to depart from my basic position that as the matter now comes before the court the Order should not be set aside.

I would, however, modify Order No. 428 in one respect. I would strike its provisions prohibiting refunds to pipelines and large producers, leaving open to the Commission to exercise such authority as it has to protect large producers and pipelines in the event the Commission finds they have been charged unreasonably high prices by small producers. As thus modified I would affirm Order No. 428 and its alphabetical series. Should such a modification temper to a degree the charges of small producers, I think that result must be accepted as required by the public interest represented by the Act. I do not think such possible tempering would go so far as to defeat the purposes of Order No. 428.

I respectfully dissent.

[Press release dated Sept. 3, 1970]

SEPTEMBER 3, 1970.

From the Office of Senate Antitrust and Monopoly Subcommittee.

Senator Philip A. Hart (D-Mich) has asked the Federal Power Commission to delay a proposed natural gas price hike until it is determined by the Federal Trade Commission if there truly is a gas shortage.

Hart noted that the industry argues the increase is needed to encourage exploration for gas in order to alleviate a serious shortage.

Normally reliable sources, Hart said, have alleged that gas producers are not reporting discoveries and that there is a "strike" of producers—who are collectively withholding gas from the market pending an increase.

The proposed rate increase reportedly would raise gas costs by 50 to 100 percent for consumers, utilities and industrial users.

Hart called upon the Federal Trade Commission to use its "unique authority and expert manpower" to check out the allegations and determine the exact gas reserves.

He told the FPC that since its information on gas reserves is limited to data the industry supplies voluntarily, "with all the unknowns, it seems a Commission decision on a rate increase would be less than 'informed'."

"If a rate increase is unavoidable," Hart asked the FPC to put the added revenue in escrow until a geological survey of reserves is completed. Also, he said, care should be taken to see that only "true" new discoveries enjoy the new rate and that unreported "new" discoveries and discoveries made prior to the increase are not "grandfathered in."

Hart also expressed concern over the growing dominance of the entire energy field by the oil companies.

He asked the FPC to recommend legislation giving it the authority to "evaluate the interrelationship of basic heating fuels", including regulating "artificially induced shortages of coal and heating oil which may cause gas shortages."

(Complete text of both letters attached.)

Attachment 1

SEPTEMBER 1, 1970.

Hon. A. EVERETTE MACINTYRE,
Acting Chairman, Federal Trade Commission,
Washington, D.C.

DEAR MR. MACINTYRE: The Senate Antitrust and Monopoly Subcommittee has been conducting a study of the energy industry. Information which recently has come to our attention with respect to the basic fuels, i.e., coal, oil and natural gas is extremely disturbing.

GAS

The Federal Power Commission currently is holding hearings on proposed rate increases in natural gas. One of the reasons given in favor of the increase is that we presently are faced with a shortage of known reserves, and an incentive is needed for the exploration, development and production of new natural gas. The basic statistics on known reserves have been furnished to the Federal Power Commission on a voluntary basis by the industry. It is my understanding that FPC does not have the authority or the mechanics needed for an independent determination of reserves. Natural gas producers and pipeline concerns have recommended price boosts of 10 to 15 cents for each 1,000 cubic feet in new interstate gas sales contracts according to the "Wall Street Journal." This apparently would mean a rise of from 50 to 100 percent of the cost of new gas supplies to consumers, utilities and industrial users.

The industry information on gas reserves would indicate that there is indeed a shortage of reserves. Yet, there have been numerous allegations that the producers are collectively withholding information on new discoveries and are awaiting the proposed price increase in order to obtain the higher rate before reporting or developing these new finds. For example, Joseph Swidler, Chairman of the New York Public Service Commission, has been quoted as saying that natural gas producers are holding back gas supplies waiting for a better price and are sitting on gas leases and not attempting to explore for gas. Louisiana Governor John J. McKeithen has stated that the Conservation Department has found 1,100 gas wells shut in, mostly waiting for higher wellhead prices.

In recent testimony before the Feedral Power Commission, Docket Nos. AR 69–1, Albert F. Bass, a petroleum engineer associated with National Economic Research Associates, Inc., concluded that based upon his investigation and study of the gas reserves of the Southern Louisiana area, the available public information was not sufficient to determine the actual magnitude of the available gas supply. Mr. Bass also raises the possibility that producers are delaying reports or not reporting new gas discoveries. A copy of this testimony is enclosed for your information.

COAL

The country is also faced with an apparent serious shortage of coal. The Office of Emergency Preparedness estimates total 1970 use of coal at 583 million tons and production at 571 million. TVA is reported to have a coal supply of only 10 to 12 days and only 4 days' supply in some plants. Furthermore, it is paying as much as 100 percent more for coal than it was paying at the beginning of this year. Statements received during Subcommittee hearings raised a serious question as to whether the acquistion of coal companies and coal-producing properties by oil companies has contributed to the shortage and price increases and whether there has been a deliberate withholding of coal from the marketplace.

OIL

A similar situation exists with regard to oil products used for heating and power generation. The last few months have seen dramatic increases in fuel oil with prices being raised simultaneously by major fuel suppliers. There have been numerous complaints to the Subcommittee with respect to the inability of utilities and distrbutors to obtan these products.

The dominance of major oil companies in gas, oil and coal energy resources, coupled with the simultaneous price increases and shortages in all of these energy resources, raises serious antitrust questions; and, in my view, warrant a thorough and speedy investigation by the Commission. If this trend is left unattended, the public faces at best spiraling costs for heating, lighting and transportation, and at worst a cold and dark winter. In addition, a number of manufacturers foresee plant curtailment or closures as a resul of power shortages and greatly increased cost of operation, thereby giving a new impetus to the continued growth of unemployment and inflation.

It seems to me that this situation calls for immediate action, and the Commission is uniquely equipped in expert manpower and statutory authority to examine the allegations of an artificially induced shortage of natural gas and to provide the facts to settle the question of reserves finally.

Therefore, I suggest that the Commission should use its broad investigating authority under Section 6 of the Federal Trade Commission Act to:

1. Accurately and objectively determine the proven, probable, possible and speculative gas reserves of the leading producers.
2. If there is a withholding of gas reserves and delay in reporting new proven or probable gas reserves, determine whether this is attributable to a combination or other conduct violative of Section 5 of the Federal Trade Commission Act or the antitrust laws.
3. Determine if the alleged shortage of natural gas is related to oil company dominance of competing energy resources.

In view of the pending gas rate increase under consideration by the Federal Power Commission and their apparent lack of information in this area, I would respectfully request that you furnish the Antitrust Subcommittee with this material at the earliest time. Please feel free to contact the Subcommittee staff for any assistance they may be able to render in your investigation.

Sincerely,

PHILIP A. HART, *Chairman.*

Attachment 2

Hon. JOHN N. NASSIKAS,
Chairman,
Federal Power Commission,
Washington, D.C.

DEAR CHAIRMAN NASSIKAS: Members of the Federal Power Commission have been making public statements that a rate increase for natural gas is essential in order to avoid winter shortages and encourage new discoveries. The increase proposed is reported to mean a doubling of consumer costs for residential use and substantial increases for industrial users.

The Commission apparentily finds itself in a dilemma: grant the increase or encourage "freeze outs".

Neither choice is a comfortable one—and I sympathize with the Commission if it must make that choice.

However—as you will see from the enclosed copy of my letter to the Federal Trade Commission—my greatest discmofort with this portrayal is not the presumed dilemma but that it may not be a true picture of the situation.

It is my understanding that the Commission's evaluation of how much natural gas is readily available now is based on information supplied voluntarily by the industry. The Commission, as I understand, is unable to determine objectivity the proven, probable, possible and speculative reserves. Neither, I am told, does it know—nor can it find out—whether there is a "strike" by producers or a suppression of existing but unreported discoveries of natural gas.

All of the these unkowns, it seems to me, make a decision on a rate increase by the Commission less than "informed". Of course, anything less than a "best effort" would not be in keeping with the responsibility to the public interest the Commission has.

As you see from my letter, I have called on the FTC to get information the Commission lacks and which seems essential to a rational decision on the rate increase. The FTC is uniquely equipped in expert manpower and statutory authority to examine the allegations of an artificially induced shortage and to provide the facts to settle the question of reserves finally.

This study, I realize, may not solve the threat of short-term shortage this winter. Neither can it eliminate the long-range problem the FPC has in rationally establshing equitable rates without objectively obtained supply information.

Therefore, I would appreciate the Commission considering these steps:

I. GAS SHORTAGE

A. Suspend considering a rate increase until the FTC has reported; or

B. If a rate increase is unavoidable, develop definitions and safeguards to assure only "true" new discoveries of provable and probable reserves enjoy the new rate and prohibit "grandfathering" in discoveries which were in fact made prior to the rate increase; and

C. Require revenue from the new rate be placed in escrow, subject to rebates, until an objective survey of proven, probable, possible and speculative gas reserves is completed.

II. POWER COMMISSION AUTHORITY

Present Congress with recommendations for legislation to authorize the FPC to require geological information from producers and authority for its own surveys of gas reserves so the Commission may make informed rate decisions.

III. INTERFUEL COMPETITION AND SUPPLIES

Recommend legislation authorizing the FPC to evaluate the interrelationship of basic heating fuels; to control interlocking or conglomerate ownership of fuel resources; and, to investigate and regulate artificially induced shortages of coal and heating oil which may cause gas shortages or an uneconomic allocation of energy resources.

In view of the emergency which we are supposedly facing, hopefully you will agree that an early decision on these suggestions would be beneficial.

Sincerely,

PHILIP A. HART, *Chairman.*

Enclosure. [Retained in committee files.]

FEDERAL TRADE COMMISSION,
Washington, D.C., October 13, 1970.

HON. PHILIP A. HART,
Chairman, Senate Subcommittee on Antitrust and Monopoly,
The U.S. Senate, Washington, D.C.

DEAR SENATOR HART: This letter is in response to your letter of September 1, 1970, concerning natural gas and related energy matters. The Commission has engaged in an intensive initial review of the important questions raised by your letter. In this process, the willing assistance of the staff of the Antitrust and Monopoly Subcommittee, as well as the Federal Power Commission, has been greatly appreciated.

The Commission is initiating a vigorous investigation of practices and transactions in and affecting the energy field which present significant competitive and consumer problems. In the energy field, as well as any other to which our jurisdiction and responsibility extends, we welcome your suggestions as well as the transmission of any helpful information held by the Antitrust and Monopoly Subcommittee.

As you know, the energy sector of our economy is one of several concentrated industries which the Commission has planned to study. Because of our concern about energy issues such as those which you raise, the Commission has directed today that the initial planning phase of the energy portion of the concentrated industries study be given high priority. We expect that this expedited planning phase of the energy portion of the concentrated industry study will provide a great deal of information which will assist the Commission in developing the further scope of our intended investigation in this field.

Dealing more specifically with the immediate concern expressed in your letter of September 1, 1970, our staff has reviewed the current criticism relating to the reporting, estimation, and deployment of reserves by the natural gas industry. In order that the possibility of collusion or other unlawful conduct in this field may be more fully explored, we have today directed that our staff commence an investigation which will focus principally on the reporting, estimation and deployment of reserves by the natural gas industry in one selected area of the country, including related trade association activity. We believe that this investigation is also properly part of the larger energy problem and will enable the Commission to properly appraise the antitrust as well as consumer protection significance of gas reporting methods and procedures presently employed.

Also in the energy field more generally, we have today directed that the staff give expedited, priority treatment to current merger activity in the energy field, including a number of pending matters.

By the Commission.

JOSEPH W. SHEA,
Secretary.

FEDERAL TRADE COMMISSION,
Washington, D.C., May 14, 1971.

HON. PHILIP A. HART,
Chairman, Senate Subcommittee on Antitrust and Monopoly, U.S. Senate, Washington, D.C.

DEAR MR. HART: As you will recall, in my letter to you of October 13, 1970, I indicated that the staff of our Bureau of Competition had been directed to undertake a limited antitrust investigation of the estimating and reporting procedures of natural gas reserves in Southern Louisiana in order to explore suggestions as to the possibility of collusion or other unlawful conduct in this field. This investigation is currently under way. The staff is also now analyzing certain energy merger transactions, including situations involving oil company acquisitions or other extensions into competing fuel areas. In this area, our analysis includes consideration of the competitive effects of the Continental Oil-Consolidation Coal merger transaction.

In addition, my letter reported on the status of our concentrated industries project—an important component of which is a structural and performance inquiry into the energy sector, explaining that "the Commission has directed today that the initial planning phase of the energy portion of the concentrated industries study be given high priority." I indicated that, upon the completion of this initial planning phase, the Commission would be in a better position to determine the further scope of our activity within the energy field.

Pursuant to Commission direction, the staff has now completed, and submitted to the Commission, memoranda discussing and outlining the possible dimensions of study areas within the energy area, accompanied by estimates of the resource demands which would be associated with them. The staff reports recommend that the Commission direct its attention to four specific problems in the energy field, each of which relates to the degree of present concentration. These are as follows:

1. A careful investigation and definition of competitive market boundaries within the energy sector, focusing largely on inter-fuel substitutability within the various demand markets. Staff estimates that this study element, most important in terms of antitrust merger enforcement policy, can be completed in about 3 months;
2. An empirical analysis of concentration and concentration trends within the energy sector, utilizing production and sales data, and examining the extent to which the use of regional geographic market dimensions are appropriate. It is estimated by the staff that this structural element can be completed in about a year;
3. A careful examination of the relationships between concentration levels within the energy sector and industry profitability, as a prime empirical indicator of the existence and application of market power. The staff estimates that this performance element can be completed in 3–4 months, assuming the availability of the relevant data;
4. An inquiry into effects of structural change on new investment and research and development within the energy sector. It is estimated that this portion of the concentration project will take 1½ to 2 years for completion and will involve substantial economist and attorney time.

Having considered the material which has been prepared by the staff, the Commission this week directed the Bureau of Economics (supported by the Bureau of Competition) to commence work on the study of those four areas. The Commission is of the opinion that these areas can be managed with our existing manpower, although it will involve a considerable portion of our resources.

The Commission concurs with the staff's belief that this study plan for the energy portion of the concentration project is significant from a policy and economics standpoint. The areas referred to above are discussed in greater detail in the enclosed staff memoranda.

The Commission also has discussed and considered some of the other basic areas which must be explored if intelligent answers to our current energy problems are to be developed. They are questions which exist within the energy field, but which are outside of the scope of our concentrated industries study. Two of the most important of such areas of inquiry, also discussed in the enclosed staff memoranda, appear to be as follows:

1. An analysis of the structure of the energy sector in order to ascertain the ownership and control of energy reserves in addition to focusing on production and sales data. Staff indicates that this type of study effort—by whomever conducted—would require a large technically-qualified staff and sizable annual appropriations for a period of 2 to 3 years;
2. A general exploration of long-run energy supply problems, dealing not only with industry structural and performance information (including reserves data) but also analyzing the effects of external factors such as the interplay of the numerous governmental policy forces which affect the total energy picture. This type of project, it is estimated would also require a large staff with diversified expertise and substantial annual appropriations.

The Commission is of the view that these two study possibilities are quite distinct from the earlier four in terms of scope of the undertaking. Unfortunately, the study of these areas would involve a commitment of resources far beyond those presently available to us. The Commission feels, however, that it is essential that these areas be fully explored—either by the Congress or by an agency or institution designated and funded by the Congress.

We are aware that the Senate has passed a resolution authorizing an energy study which encompasses some aspects of the broader study possibilities discussed in the enclosed staff memoranda, and of the general Congressional concern that an energy study be commenced. The Commission has great interest in seeing that the energy sector receives the careful economic study it demands, and that relevant competitive issues are given appropriate attention in the process. While as noted above, such a study is not within the present resource capabilities of the Commission, we would urge that the Congress give this matter continued priority attention and that the appropriate study or studies be undertaken by the Congress or by some appropriate agency or institution authorized by the Congress.

I am hopeful that our planned activity within the energy area will contribute to a fuller understanding of the energy sector and be of policy significance to us and to others. Your comments about our plans and activities in this area would be most welcome.

By direction of the Commission.

Sincerely,

Miles W. Kirkpatrick, *Chairman.*

U.S. Senate,
Subcommittee on Antitrust and Monopoly,
June 23, 1971.

Hon. Miles W. Kirkpatrick,
Chairman, Federal Trade Commission,
Washington, D.C.

Dear Mr. Chairman: As you may know several days ago at my direction the Senate Antitrust and Monopoly Subcommittee staff turned over to the Federal Trade Commission staff the documents which were the basis of the recent Jack Anderson columns on natural gas. These documents show that high FPC officials have substantial doubts about the reliability of American Gas Association estimates of natural gas reserves. Copies of these documents had been supplied me by Mr. Anderson.

It is my understanding that these documents had not been made available to your staff by the Federal Power Commission during discussions on this matter.

Considering the direct bearing these documents seem to have on the credibility of the industry-supplied data on natural gas reserves—the subject of the investigation you took on at my request—I am very much concerned that the FPC has not made this vital data available to you.

Because consumers are facing a $4 billion natural gas rate increase on the assumption that there is a shortage, the views of the FPC experts have significant importance. May I respectfully suggest that FTC immediately review all FPC staff memorandum and studies bearing on this subject as part of your effort to determine the real facts.

Sincerely,

Philip A. Hart, *Chairman*

[Press release dated Oct. 18, 1972]

From the office of Senate Antitrust and Monopoly Subcommittee.

Labeling basic antitrust work and economic studies by the Federal Trade Commission its most important consumer work, Senator Philip A. Hart (D-Mich) has prodded the FTC chairman for action in six areas.

Hart asked for a status report on four investigations—gasoline, auto parts distribution, natural gas and pro-strip mining ads—and two studies—concentrated industries and conglomerates.

In a letter to Chairman Miles W. Kirkpatrick, Hart praised the "turn around in the public image" of the Commission under Kirkpatrick's chairmanship.

"However, I am concerned that while a great deal of work has been done in the surface consumerism areas—such as advertising practices—full revitalization has not seeped through to the more pure antitrust areas or to fulfilling the duties of the Commission to do economic studies for Congress," Hart said.

He asked Kirkpatrick what appropriation the FTC needs to move its antitrust and economic study work along and volunteered help in getting the money.

[Full text attached.]

October 11, 1972.

Hon. Miles W. Kirkpatrick,
Chairman, Federal Trade Commission,
Washington, D.C.

Dear Mr. Chairman: More than two years ago, following Antitrust Subcommittee hearings on the gasoline industry, I asked the Federal Trade Commission to investigate possible antitrust violations in the industry. Two particularly troublesome practices which the Federal Trade Commission agreed to look into were arbitrary termination and zone price supports.

As you may have noted, two court decisions in recent weeks—one in the Seventh Circuit and one in the Superior Court of New Jersey—held these practices illegal. Also, the judges indicated they viewed zone price supports as violations of the Robinson-Patman Act.

So—subject to appeal and after the expenditure of a great deal of money—at least two gasoline retailers may be out from under these practices.

However, I am deeply concerned about those of the other 385,000 gasoline retailers who could be trying to survive with severe competitive disadvantages. My concern is especially strong because the turnover in this industry is about the most depressing of any of which I have knowledge. According to figures developed by the American Petroleum Institute, at least one in five gasoline retailers goes out of business annually. This figure makes allowance for such "normal" occurrences as retirement, illness or death. In really troubled areas—especially those where price wars are almost a way of life—the turnover is much higher. For example, during our hearings we learned that the rate in Detroit was in the range of 35 to 40 percent.

So the cold, hard fact is that each month's delay in action means that literally hundreds of retailers will be out of business and beyond help. When you consider that termination can cost a retailer his life's savings and, we have been told, even his home, speed becomes more essential.

Would you please tell me the status of this investigation? Especially, I would like an opinion on when the Commission may be ready to decide if it will be acting in this area.

Not to presume upon you—but to clear up a lot of loose ends—may I extend my request for updating to several other Federal Trade Commission investigations in which I have a special interest.

For example, in 1968, the staff of the Antitrust Subcommittee began discussions with your staff about distribution methods for sheet metal auto parts. Our concern was born of an arrangement with General Motors and other leading domestic automobile manufacturers, apparently in lieu of filing a proposed Federal Trade Commission complaint against General Motors.

Over the years, independent members of the repair industry have made clear to me their fear that the arrangement worked out was in effect restructuring the industry. Further, the insurance industry and others pointed out that the result also was a significant increase in consumer prices for auto sheet metal parts.

During the 1970–72 period, prices for auto parts, tires, etc. increased 36.8 percent. Crash repairs rose 111 percent from 1960 to 1971. In other words, in 1971 motorists paid about $7 billion for parts they could have bought in 1960 for a little more than $3 billion.

In March of 1970, when appearing before the subcommittee, then Federal Trade Commission Chairman Weinburger told me the Federal Trade Commission was doing a study of auto repair parts with special attention to Robinson-Patman aspects of the industry, and promised it would be concluded by November 1970. In September of that year, you wrote me the study was moving along. In January of this year, you advised me the task force study had been transmitted to the Commission and action could be expected shortly.

As of this date, I have seen neither the study nor Commission action based on it.

If, in fact, as members of the industry claim, restructuring is going on and if it does indeed tend toward concentration, we once again could face the situation of trying to help businessmen who won't be there to help.

Now, if I have not worn out my welcome, I do have several other areas to get into.

For example, I am deeply concerned whether the Federal Trade Commission is pursuing its investigation of possible collusion in withholding natural gas supplies with as much enthusiasm as the situation demands.

The Federal Trade Commission, again in response to a request from me, took on this study in September 1970. Since—through the press and remarks of members of industry and regulatory agencies—we have been plagued with proposed solutions to a problem we are not sure exists—the shortage of natural gas. Finally, in a move which I still feel was beyond its authority, the Federal Power Commission a few weeks ago de-regulated natural gas prices. It's a step that will cost consumers an estimated $750 billion over the next 20 years.

Apparently—and I mean no criticism—the gas industry has been using all legal tools at its disposal to impede the Federal Trade Commission investigation. However, I am interested in knowing what ammunition the Commission is using in return. For example, how much staff is assigned? At what stage is the investigation? How vigorously does the Commission plan to pursue it?

On another front, I am most interested in knowing when the second part of the conglomerate study will be ready. As you may recall, this was begun in mid-1968 and the first report delivered to the subcommittee in late-1969. At that time, we were told the second part of the study—concerning the impact of conglomerate mergers on industrial behavior and performance—would be along later. Could you update me on the status of that?

In the same field, I would like to know the current status of the concentrated industries study. As I recall, the Federal Trade Commission first announced that six industries would be studied. However, more recently I have read that the number is down to two—or possibly three.

Finally, there is one other request—related to the energy area which you are working in but falling more on the advertising side. This was my request in July of last year that the Federal Trade Commission take a hard look at the veracity of some of the ads being placed by industry and trade associations favoring strip mining. A report on the progress in that area also would be appreciated.

There is no question that under your chairmanship, the Commission has turned around its public image. Nor is there any question but that the more favorable image is deserved. However, I am concerned, that while a great deal of work has been done in the surface consumerism areas—such as advertising practices—full revitalization has not seeped through to the more pure antitrust areas or to fulfilling the duties of the Commission to do economic studies for Congress.

Now, I know that you can't do everything at once and I know that you must allocate funds in the manner you see as best. However, I am convinced that the basic antitrust work and the economic studies the Commission can do can have the greatest impact on the consumer and the nation in the long run.

Therefore, anticipating that you may explain the delay in some of these areas as due to lack of funds, I would like to ask one more thing:

Would you be so kind as to tell me what appropriations you see as necessary to move these studies and others you deem necessary along speedily. I will be most happy to do my best to help the Commission get that sum in its next appropriation.

With best wishes,

Sincerely,

PHILIP A. HART, *Chairman.*

FEDERAL TRADE COMMISSION,
Washington, D.C., November 15, 1972.

Hon. PHILIP A. HART,
Chairman, Subcommittee on Antitrust and Monopoly,
U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: This is in response to your letter of October 11, 1972, requesting an update on the various programs and investigations the Commission is pursuing. In order to expedite a response to your request, I will, below, summarize briefly the events and status of those cases inquired of. A more detailed explanation of those cases will be sent to you by the Bureau Directors involved.

In the gasoline industry, as you know, the Commission has issued proposed complaints and orders against both Phillips Petroleum and Standard Oil of Ohio, based upon alleged abuses by the oil companies of their dealers. There are also a number of investigations progressing on the "zone pricing" issue, wherein the Commission has authorized the use of compulsory process.

In the "crash parts" area, the investigation you referred to in your letter has been concluded. It was found, however, that there was not sufficient information then available to make a valid determination regarding competition among the industry members. The Commission, therefore, has authorized the use of compulsory process to expedite the finalization of this study. The Commission has likewise authorized compulsory process in the investigation of natural gas resources. Vigorous opposition by the oil companies makes it difficult to predict a date for completion of this investigation, but I am informed that substantial advances have been made.

There are presently four concentrated industries studies, including the fields of energy, electrical equipment, drugs and automobiles. The energy investigation is further broken down so that there are, in the aggregate, a number of studies covering various segments of the industry. The conglomerate merger study, I am told, is complete save for minor details, and should shortly be before the Commission.

With regard to the advertising by some companies and its veracity *vis a vis* the environment, an investigation into advertising claims relating to reclamation including strip mining and its effects is continuing. This study is being conducted by the Bureau of Consumer Protection. As Mr. Pitofsky recounted in his letter to you of August 13, 1971, there are certain problems to be overcome in proceeding with this investigation. I am advised that for the most part the difficulties have been resolved and the investigation continues.

I hope this brief synopsis serves adequately to apprise you of the status of those investigations you asked about. As I said, the Bureau Directors involved will be in touch with your office with more detailed accounts. If I can be of further assistance, please let me know.

By direction of the Commission.

MILES W. KIRKPATRICK, *Chairman.*

FEDERAL TRADE COMMISSION.
Washington, D.C., May 14, 1973.

Hon. PHILIP A. HART,
Chairman, Subcommittee on Antitrust and Monopoly,
U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: I am writing to provide you with details concerning three of this Bureau's investigations about which you inquired in your letter of October 11, 1972: (1) natural gas; (2) gasoline zone pricing and dealer termination; and (3) automotive "crash parts".[1]

NATURAL GAS INVESTIGATION

For many years, as you know, proved natural gas reserve data reported by the American Gas Association (AGA) has been widely used in connection with development and implementation of government policy in the natural gas industry, particularly by the Federal Power Commission in setting natural gas prices. The persons responsible for the AGA's reserve reporting are employees of the major producers, and through them, in essence, each producer reports reserves for his own fields.

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[1] I have disqualified myself from participation in the "crash parts" investigation. The information contained herein regarding that investigation was provided by the Bureau's staff.

A few years ago, questions were raised regarding the AGA procedures. The FPC Office of Economics, for example, noted that in 1968, in several fields, dedicated reserves appreciably exceeded AGA reported proved reserves. Proved reserves, of course, normally should exceed dedicated reserves, because dedicated reserves (which are compiled by the FPC from submissions by pipeline companies) exclude reserves held for intrastate shipment. The Office of Economics also has expressed concern over sizable negative revisions in AGA gas reserves for 1968 associated with the discovery and development of oil, without similar negative revisions in oil reserves. Most significantly, the Power Commission's Chief of the Bureau of Natural Gas noted that dedicated reserves reported by FPC staff as existing in Offshore South Louisiana in 1968 exceeded the AGA estimate for the area by 7.9 Tcf. This difference equals about one-fifth of all proved reserves reported by the AGA for that subarea.

Such substantial discrepancies, when considered in light of the procedural framework for data compilation, certainly raise the possibility of antitrust violations. Brought to mind are the numerous antitrust problems which arise when sensitive data is compiled and exchanged by members of an industry (see *e.g.*, *United States* v. *Container Corp. of America*, 393 U.S. 333 (1969) and cases cited therein).

In 1970, the Commission began its investigation to determine the possibility of collusion or other unlawful conduct in the reporting of gas reserves. Initiallly, the Bureau requested the cooperation of the AGA and, after months of negotiation, we were given access to field-by-field estimates for Offshore South Louisiana, the first time, we were told, that a government agency has seen such figures. Depositions of certain AGA officials were taken.

In November 1971, eleven companies were subpoenaed to gain access to the vital raw data including company reserve estimates, which only the major producers had. After months of negotiations, motions to quash and further motions to reconsider, only three companies have in any way responded to the Commission's subpoenas. Court enforcement proceedings against all of the other firms are anticipated. The Commission's requests for enforcement proceedings have been transmitted to the U.S. Department of Justice.

In the face of the producers' opposition to this inquiry, it is now impossible to make any firm judgments about the integrity and accuracy of the AGA reporting system. The limited amount of evidence my staff has been able to get through non-producer sources, however, confirms the need for thorough review of AGA's procedures. But until we have obtained the requested material from the producers, it is impossible to appraise the significance of this evidence.

Three attorneys in the Bureau of Competition have been working on this investigation. Two attorneys in the General Counsel's Office have been preparing Court enforcement proceedings. Additional attorneys will be assigned as the need arises. It seems likely that the investigation will not be finished during this fiscal year.

GASOLINE MARKETING INVESTIGATIONS

Your letter expressed concern over the precarious competitive existence of many gasoline retailers. Since receipt of your letter the Commission has issued complaints against the marketing practices of two major oil companies. In *Standard Oil Company of Ohio (Sohio)*, Docket 8910 (complaint issued January 18, 1973, the Commission has charged Sohio with price fixing and coercion of dealers. The complaint alleges that Sohio controls its dealers by use of short term leases, and in the Notice of Contemplated Relief, the Commission indicated that a guaranteed five-year lease for Sohio's dealers may be part of an appropriate remedy in the case.

On November 6, 1972, the Commission announced its intention to issue a complaint against Phillips Petroleum Corporation. The proposed complaint charges that Phillips has a standard form lease which provides for short term leasehold interest, and which allows Phillips to arbitrarily cancel on 10 days written notice. Additionally, Phillips is charged with causing dealers to accept concellation without an explanation or cause, requiring dealers to purchase Phillips' tires, batteries and accessories (TBA), requiring dealers to maintain minimum levels of Phillips products to secure loans from Phillips, and requiring a stated minimum gasoline purchase, which constitutes a dealer's total requirement or a major percentage of a dealer's gasoline sales.

The Notice of Contemplated Relief in this case also includes a ban on lease agreements with terms of less than five years, a ban on lease cancellations or threats to cancel except for good cause and a ban on requirements that dealers deal exclusively in TBA products manufactured, distributed or sponsored by Phillips. Settlement negotiations with Phillips, so far, have not been successful.

The Commission's zone pricing inquiry, still in the investigatory stage, is primarily centered in the Detroit area and involves Shell, Mobil, American and Texaco. Subpoenas and a request for a special report have been served, partial subpoena returns have been made, and investigational hearings have been held. We expect to make our recommendations to the Commission in this matter in early summer.

To a large extent, the problems we see manifested at the marketing level of the petroleum industry may be symptoms of serious competitive problems in the production, refining and transportation segments of the industry. Recognizing this, the Commission in December 1971 directed us, working with the Bureau of Economics, to determine the effects of vertical integration and joint ownership and operating arrangements on the structure, conduct and performance of the petroleum industry. In connection with this directive, numerous interviews and file searches are now being conducted at all levels of the petroleum industry. At this stage of the investigation, we have not reached and firm conclusions about the existence of antitrust violations.

"CRASH PARTS" INVESTIGATION

The heart of the problem in the automobile crash parts industry is the control maintained by GM, Ford and Chrysler over manufacture and distribution of replacement crash parts. Production of these parts is either handled by the auto makers or contracted out according to rigid specifications. In the latter case, the auto makers exercise exclusive ownership or rights over the blueprints and resultant tools and dies necessary to produce crash parts for each of their respective car models. The contractors produce only the quantity requested by the auto makers, and, it would seem, are effectively precluded from selling to anyone but them. Here, too, gathering evidence has been time consuming and difficult. The staff foresees, however, that by year's end a decision can be made as to the appropriate disposition of this matter.

I am hopeful that this letter has provided you with the information you desire. If you need further assistance, please do not hesitate to call upon me.

Very truly yours,

ALAN S. WARD,
Director,
Bureau of Competition.

In the United States District Court for the District of Columbia
Civil Action No. ——

FEDERAL TRADE COMMISSION, 6TH AND PENNSYLVANIA AVENUE NW., WASHINGTON, D.C., PETITIONER
v.
O. N. MILLER, CHAIRMAN, AND, STANDARD OIL COMPANY OF CALIFORNIA, A CORPORATION, 225 BUSH STREET, SAN FRANCISCO, CALIF., RESPONDENTS

PETITION FOR AN ORDER REQUIRING RESPONDENTS TO APPEAR, TESTIFY AND PRODUCE DOCUMENTARY EVIDENCE IN AN INVESTIGATION BEING CONDUCTED BY THE FEDERAL TRADE COMMISSION

Petitioner, the Federal Trade Commission, with authorization of the Attorney General of the United States, and pursuant to Section 9 of the Federal Trade Commission Act, 15 U.S.C. § 49, hereby respectfully petitions the Court in this summary proceeding for an order requiring the respondent, Standard Oil Company of California, by respondent O. N. Miller, Chairman, to appear before a designated representative of the Federal Trade Commission and to testify and produce books, records and documents in accordance with a subpoena *duces tecum* issued by petitioner in November 24, 1971. A copy of said subpoena is attached hereto and incorporated as Exhibit 1.

In support of this petition, petitioner further alleges the following:

1. Petitioner, the Federal Trade Commission, is an administrative agency of the United States Government and is empowered and directed by Section 5 of the Federal Trade Commission Act, 15 U.S.C. § 45, to prohibit unfair methods of competition in commerce and unfair or deceptive acts or practices in commerce. It is empowered by Section 3 of the Federal Trade Commission Act, 15 U.S.C. § 43, to prosecute any inquiry necessary to its duties in any part of the United States and, by Section 6 of said Act, 15 U.S.C. § 46, to gather and compile information concerning, and to investigate from time to time, the organization, business, conduct, practices and management of corporations engaged in commerce and their relation to other corporations and to individuals, associations and partnerships.

Section 9 of the Federal Trade Commission Act, 15 U.S.C. § 49, empowers the Commission to require by subpoena the attendance of witnesses and the production of documentary evidence relating to any matter under investigation. Such attendance of witnesses and production of documentary evidence may be required from any place in the United States at any designated place of hearing.

2. Respondent Standard Oil Company of California ("Standard-California") is a corporation organized under the laws of the State of Delaware, and it maintains an office and its principal place of business at 225 Bush Street, San Francisco, California 94120.

3. Jurisdiction of this cause and over respondents and the power to issue the order prayed for herein are conferred upon this Court by the aforesaid Section 9 of the Federal Trade Commission Act which provides that "[a]ny of the district courts of the United States within the jurisdiction of which such inquiry is carried on may, in case of contumacy or refusal to obey a subpoena issued to any corporation or other person, issue an order requiring such corporation or other person to appear before the commission, or to produce documentary evidence if so ordered, or to give evidence touching the matter in question * * *." The investigatory proceeding, in the course of which petitioner's subpoena was issued and served, is being conducted by petitioner within the jurisdiction of this Court.

4. Acting pursuant to its authority and duties referred to in numbered paragraph 1 above, petitioner is now and at all relevant times has been carrying on a nonpublic investigation (Federal Trade Commission File No. 711 0042) to determine whether Continental Oil Company, Gulf Oil Corporation, Mobil Oil Corporation, Shell Oil Company, Standard Oil Company (California). Humble Oil & Refining Company, The Superior Oil Company, Inc., Texaco, Inc., and Union Oil Company of California, and other persons and corporations, individually or in concert, are engaged in conduct in the reporting of natural gas reserves for Southern Louisiana which violates Section 5 of the Federal Trade Commission Act, or are engaged in conduct or activities relating to the exploration and development, production, or marketing of natural gas, petroleum products, and other fossil fuels in violation of Section 5 of the Federal Trade Commission Act.

A copy of the resolution issued by petitioner on June 3, 1971, directing the use of compulsory process in said investigation is attached hereto and incorporated as Exhibit 2.

5. In connection with said investigation and pursuant to the authority duly delegated by petitioner's published rule (16 C.F.R. § 2.7), Owen M. Johnson, Jr., an Assistant Director of the Commission's Bureau of Competition, on November 24, 1971, issued and caused to be served on respondents the aforesaid subpoena (a copy of which, as heretofore noted, is attached hereto and incorporated as Exhibit 1), requiring respondents to appear before a named attorney examiner of the Commission at Room 368, Federal Trade Commission Building, 6th Street and Pennsylvania Avenue, N.W., Washington, D.C., on December 27, 1971, to testify and produce specified books, papers and documents. Similar subpoenas were issued and served on the following named corporations and principal officers thereof: Continental Oil Company, Gulf Oil Company, Mobil Oil Company, Pennzoil Company, Shell Oil Company, Standard Oil Company (New Jersey) (name subsequently changed to Exxon Corporation), Standard Oil Company (Indiana), The Superior Oil Company, Texaco, Inc., and Union Oil Company of California.

6. On December 23, 1971, respondent Standard-California filed a motion to quash the subpoena contending, *inter alia*, that (a) the Commission failed to comply with the Federal Reports Act of 1942 (44 U.S.C. §§ 3501–3511), (b) the Commission lacks jurisdiction to conduct the investigation in that exclusive and

primary jurisdiction in the area rests with the Federal Power Commission which agency is allegedy exercising such jurisdiction, (c) the subpoena is directed to confidential information, the disclosure of which would impair the competitive position of Standard-California, (d) the resolution under which the subpoena was issued failed to advise as to the nature and scope of the investigation, and (e) compliance with the subpoena would be unduly broad and oppressive as to time and scope.

7. On June 27, 1972, the Commission issued its order denying Standard-California's motion to quash, together with an accompanying opinion giving the reasons for its action. A copy of said order and opinion are attached hereto and incorporated as Exhibit 3.

8. With respect to Standard-California's claim that the subpoena required the approval of the Office of Management and Budget, the Commission concluded in the aforesaid opinion that such approval is not required with respect to investigational subpoenas issued for law enforcement purposes. This conclusion accords with the views of the Clearance Officer of the Office of Management and Budget as expressed in a letter to the Commission Liaison Officer dated October 29, 1971. A copy of this letter is attached hereto and incorporated as Exhibit 4.

9. Following the Commission's denial of motion to quash, Owen Johnson, Jr., of the Commission, sent a letter to O. N. Miller, Chairman of the Board of Standard-California, on July 7, 1972, asking for a statement indicating whether or not Standard-California intended to comply fully with the subpoena. A copy of this letter is attached hereto as Exhibit 5.

10. On July 31, 1972, Lee Loevinger, Esq., counsel for Standard-California, wrote a letter to Charles A. Tobin, Secretary of the Commission, and stated, *inter alia*, that Standard-California did not intend to comply with the FTC subpoena dated November 24, 1971. A copy of this letter is attached hereto and incorporated herein as Exhibit 6.

11. In further support of this petition, there is attached hereto and incorporated as Exhibit 7 the affidavit of Donald K. Tenney, a senior attorney in the Federal Trade Commission's Bureau of Competition and one of the attorneys assigned to conduct the Commission's investigation pursuant to which the subpoena here sought to be enforced was issued.

12. No previous application has been made to this or any other Court for relief herein prayed.

Wherefore petitioner respectfully invokes the aid of this Honorable Court and prays:

(1) That it issue an order directing respondent Standard Oil Company of California, by respondent O. N. Miller, to appear before such duly appointed examiner of petitioner as may be designated by petitioner at a date, time and place to be determined by petitioner, and to testify and produce specified books, papers and documents in response to the subpoena issued by the Commission on November 24, 1971;

(2) That petitioner be awarded the costs of this action; and

(3) That petitioner be given such other and further relief as this Court may determine to be just and proper.

ATTORNEYS FOR PETITIONER

James T. Halverson,
Acting General Counsel.
Harold D. Rhynedance, Jr.,
Assistant General Counsel.
Miles J. Brown,
Attorney.
Montgomery K. Hyun,
Attorney.
Harold H. Titus, Jr.,
U.S. Attorney.
Arnold T. Aikens.
Assistant U.S. Attorney.
——— ———
Assistant U.S. Attorney.
Gregory B. Hovendon,
Attorney.

VERIFICATION

Charles A. Tobin, being duly sworn, deposes and says that he is Secretary of the Federal Trade Commission; that he has read the contents of the foregoing petition and the attachments thereto; that the facts stated in said petition are true and the Exhibits, except for Exhibit 7 and the attachments thereto, are copies of papers contained in the official files of the Federal Trade Commission; and that he has been authorized by the Federal Trade Commission to execute this verification.

CHARLE A. TOBIN, *Secretary.*

Subscribed and sworn to before me, a notary public in and for the District of Columbia, on this 8th day March, 1973.

JUANITA A. WELLS,
Notary Public.

My Commission Expires March 15, 1977.

EXHIBIT 1

Subpena Duces Tecum

UNITED STATES OF AMERICA

FEDERAL TRADE COMMISSION

Mr. O. N. MILLER, *Chairman,*

To: Standard Oil Company of California, Standard Oil Building, 225 Bush Street, San Francisco, California 94120

You are hereby required to appear before Donald K. Tenney, an Attorney and Examiner of *the Federal Trade Commission, at* Room 368, Federal Trade Commission Building, 6th and Pennsylvania Avenue, N.W., *in the City of* Washington, D.C. 20580 *on the* 27th *day of* December, *1971, at* 10:00 *a.m., to testify* in connection with the Commission's investigation of various corporations and persons, File No. 711 0042, pursuant to Commission Resolution dated June 3, 1971, a copy of which is attached and made a part hereof, for the purposes stated therein.

And you are hereby required to bring with you and produce at said time and place the following books, papers, and documents: See attached "Definitions" and "Specifications."

Fail not at your peril.

[SEAL]

In testimony whereof, the undersigned, an authorized official of the Federal Trade Commission, has hereunto set his hand and caused the seal of said Federal Trade Commission to be affixed at Washington, D.C., this 24th day of November, 1971.

OWEN M. JOHNSON, Jr.,
Assistant Director Bureau of Competition.

NOTICE TO WITNESS.—If claim is made for witness fee or mileage, this subpoena should accompany voucher.

DEFINITIONS

As used herein, the term "documents" means all writings of every kind including books, records, folios, minutes, reports, memoranda, correspondence, agreements, discounted cash flow studies, cover sheets, calculation sheets, print outs, telegrams, dairy entries, pamphlets, notes, charts, and tabulations in the possession, custody or control of the Company. The term "documents" also includes voice recordings and reproductions or film impressions of any of the aforementioned writings as well as copies of documents which are not identical duplicates of the originals and copies of documents of which the originals are not in the possession, custody or control of the Company. The term "documents" further includes all punch cards or other cards, tapes or recordings used in data processing, together with the programing instructions and other written material necessary to understand or use such punch cards, tapes or other recordings.

In response to specifications in which the term "documents" is followed by an asterisk (*), a verified written statement by an officer of the company containing the requested information may be submitted in lieu of the documents called for provided that the underlying documents or source materials are listed or otherwise specifically identified in, or as part of, such verified statement.

Each document submitted must be identified as to the specification or specifcations to which it is responsive.

The term "the Company" means the corporation upon which this Subpoena was served as well as its directors, officers, employees, and agents; its subsidiaries and affiliates; and the directors, officers, employees and agents of its subsidiaries and affiliates. The term "the corporation" means the corporation upon which this Subpoena was served.

Unless otherwise stated, the following definitions apply to the specifications that ensue:

1. *South Louisiana.* That geographical area delineated by Map III, page 84, of the May, 1971 edition of *Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas in the United States and Canada and United States Productive Capacity as of December 31, 1970* including the offshore area. The term "Offshore South Louisiana" is defined as that geographic area which lies seaward from the Louisiana coastline. The South Louisiana Offshore Area is sometimes referred to as Federal Areas 1 through 4 and includes the West Cameron Area, East Cameron Area, Vermilion Area, South Marsh Island Area, Eugene Island Area, Ship Shoal Area, South Pelto Area, Bay Marchand Area, South Timbalier Area, Grand Isle Area, West Delta Area, South Pass Area, Main Pass Area, Breton Sound Area, Chandeleur Area and Chandeleur Sound Area and any additions thereto, as indicated on the United States Geological Survey "Oil and Gas Development Map of the Gulf Coast State of Louisiana Outer Continental Shelf", as revised on January 5, 1971.

2. *Net Production.* The definition appearing in *Technical Report No. 1,* Standard Definitions for Petroleum Statistics (First Ediiton, July 1, 1969), at page 11, is adopted.

3. *Natural Gas Present or Recoverable or Ultimately Recoverable.*

a. *Present.* Natural Gas in place, i.e., existing either in the gaseous phase or in solution with crude oil in a natural underground reservoir or reservoirs.

b. *Recoverable.* Natural gas in place that is producible.

c. *Ultimately recoverable.* Natural gas in place that is producible, together with its cumulative production.

4. *Field.* A field is an area consisting of a single reservoir or multiple reservoirs all grouped on, or related to, the same individual geological features and/or stratigraphical condition. A reservoir is a porous and permeable underground formation containing an individual and separate natural accumulation of hydrocarbons (oil and/or gas) which is confined by impermeable rock or water barriers and is characterized by a single natural pressure system.

5. *Completion Date.* The first date on which any permanent equipment for the production of oil or gas is installed in a well. Completion reports may relate to the abandonment of a well or to the installation of permanent productive equipment.

6 & 7. *Associated Gas; Dissolved Gas.* The definitions of these two terms that appear in *Technical Report No. 1,* Standard Definitions for Petroleum Statistics (First Edition, July 1, 1969), page 6, are adopted.

8. *Nonassociated Gas.* Natural gas which is in a reservoir or reservoirs not containing significant quantities of crude oil.

9–13. *Proved Reserves; Revisions; Extensions; New Field Discoveries;* and *New Reservoir Discoveries in Old Fields.* The definitions of these five terms that appear in *Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas in the United States and Canada and United States Productive Capacity as of December 31, 1970,* at pages 102–104, are adopted.

14. *Dedicated Reserves.* The volume of natural gas committed to a pipeline company and for which both the seller and the pipeline company have received certificate authorization from the Federal Power Commission.

SPECIFICATIONS

A. Documents* which will indicate the correct legal name and business address of the corporation, its date and state of incorporation, and the name, position and home address of each officer and director of said corporation.

B. Documents* which will indicate the correct legal name and business address of the parent of the corporation, the date and state of incorporation of the parent and the percentage ownership the parent has in the corporation, and the name, position and home address of each officer and director of the parent.

C. The corporation's Annual Reports for each of the years 1966, 1967, 1968, 1969 and 1970.

D. Documents* which will indicate the name and address of each subsidiary, affiliate, and division of the corporation and of the divisions of each such subsidiary and affiliate engaged in the exploration, development, production, or distribution of natural gas; the function(s) as heretofore set forth of each; and the dates and states of incorporation and the names, positions, and addresses of officers, directors, managers of each subsidiary, affiliate, and division.

E. Documents* which will indicate (1) each type of customer purchasing natural gas, produced in South Louisiana, from the corporation, its subsidiaries and affiliates and (2) the manner and methods of distribution of such natural gas to each such type of customer.

F. Documents* which will indicate the following for each of the years 1966 through 1970:

1. Total net production of natural gas, in units, in (a) the United States and (b) South Louisiana, by the corporation, its subsidiaries and affiliates.

2. Total unit and dollar volume of sales of the total net production of natural gas produced in (a) the United States and (b) South Louisiana, by the corporation, its subsidiaries and affiliates.

3. Total dollar volume of sales of the total net production of natural gas produced in South Louisiana by the corporation, its subsidiaries and affiliates to each type of customer identified in Specification E(1)—for 1969 and 1970 only.

G. Documents either received (from whatever source) or written by the Company, in whole or in part, at any time between January 1, 1962 to December 31, 1970, which contain estimates or evaluations of the volume of natural gas present or recoverable or ultimately recoverable (1) throughout all of South Louisiana (2) throughout all of Offshore South Louisiana and/or (3) in specific fields, portions of fields, leaseholds and/or portions of leaseholds located in Offshore South Louisiana.

Excluded from this specification are any documents previously made available to the Commission by the American Gas Association and presently in the custody of Price, Waterhouse & Company, 1801 K Street, Washington, D.C. Included in this specification by way of illustration but not limitation are documents containing estimates or evaluations including re-estimates or reevaluations made in connection with or in preparation for or as the result of the following: (1) bidding on or nominating leases (2) deciding whether to erect permanent platforms (3) compiling or inventorying total company reserves or supply (4) negotiating or contracting for the sale of natural gas, or for the joint or common exploration, development, production, purchase, or sale of acreage, or for obtaining blank loans (5) filing depreciation expense schedules with Internal Revenue Service or (6) submitting field-by-field estimates to subcommittees or committees of the American Gas Association or the American Petroleum Institute.

H. Documents* indicating any or all of the following with regard to each field and leasehold in Offshore South Louisiana for which estimates or evaluations of the volume of natural gas, pretaining to the whole or a portion thereof, are produced pursuant to Specification G:

1. For each such field and portion thereof, its name and the number(s) of each block number comprising said field or portion thereof—if the field or field portion is situated at least in part in a portion of a block, the portion of the block as well, e.g., "NW¼";

2. For each such leasehold and portion thereof, the OCS number and the name(s) and location(s) of the field(s) and portion(s) thereof comprising such leasehold or portion thereof.

3. The pipe line company(ies) serving each such field, leasehold, or portion thereof;

4. The producer(s) and the operator(s) of each such field, leasehold, or portion thereof, indicating the precise interest each such producer and operator has in the acreage.

5. For each such field, leasehold and portion thereof, the location (on a map) and designation of each well drilled including (for each such well):

a. The current status as classified by the Company, eg., "dry and abandoned", "temporarily abandoned", "suspended", "shut-in", "service", "producer", etc.;

b. Whether classified by the Company as an oil or gas well at the time of (1) application for drilling (2) the filing of each completion report (3) currently;

c. The number of reservoirs containing natural gas that have been penetrated by the well;

d. The date drilling commenced; the date total depth was reached; first date of testing; first date of testing officially reported; completion date; date commenced producing.

I. Documents either received (from whatever source) or written by the Company, in whole or in part, at any time subsequent to January 1, 1962, which refer, analyze, compare, comment on, set forth, and/or relate to any or all of the following:

1. Any natural gas estimates or evaluations called for by Specification G; the preparation or completion of such estimates or evaluations; the procedures, criteria or interpretations used in such preparation or completion; the identity of organizational units and personnel of the Company involved in such preparation or completion;

2. Any natural gas estimates or evaluations made available to the Commission by the American Gas Association and presently at Price, Waterhouse & Co., or appearing in any American Gas Association Report on Natural Reserves, published subsequent to January 1, 1967, including the constituent categories of these estimates such as "proved reserves", "revisions", "extensions", "new field discoveries", "new reservoir discoveries in old fields"; the preparation or completion of such estimates or evaluations; the procedures, criteria or interpretations used in such preparation or completion; the organizational units and personnel of the Company involved in such preparation or completion;

3. Any lease nominations and bids, any agreements for joint or common leasing, exploration, development, production, purchase or sale, or any cash flow or economic feasibility studies preparatory to leasing, exploring, developing, purchasing or selling, which involve Offshore South Louisiana acreage;

4. Any compilation, report or study of "dedicated reserves".

5. Whether any well designated in response to Specification H–5 contains natural gas in sufficient quantities as to be capable of producing in paying quantities.

J. Documents either received (from whatever source) or written by the Company, in whole or in part, at any time subsequent to January 1, 1966, which refer, analyze, compare, comment on, set forth, and/or relate to any or all of the following:

1. Any failures or delays, for whatever reason, in reporting proved reserves of natural gas to the American Gas Association, including any failures or delays by personnel of the Association to identify to subcommittee members all fields containing proved reserves;

2. The classification or exclusion or inclusion of volumes of natural gas as proved reserves;

3. The relationship between increases or decreases of crude oil proved reserves with increases or decreases of associated, dissolved or associated-dissolved natural gas proved reserves;

4. Negative revisions to American Gas Association proved reserve estimates because of clerical or mathematical error.

K. Documents either received (from whatever source) or written by the Company, in whole or in part, at any time subsequent to January 1, 1962, which refer, analyze, compare, comment on, set forth, and/or relate to any or all of the following:

1. The relation between the amount of "proved reserves" and the rate allowed, to be allowed, or that may be allowed for natural gas by the Federal Power Commission;

2. The reporting of lower "proved reserve" figures.

L. Documents—naming all employees of the corporation, its subsidiaries and affiliates who have, any time since January 1, 1966 with regard to Offshore-South Louisiana, estimated, evaluated or enumerated natural gas proved reserves, dissolved gas proved reserves, potential gas supply or well drilling activity either for the American Gas Association, American Petroleum Institute, Potential Gas Committee, American Association of Petroleum Geologists or the International Oil Scouts, including local scout checks, indicating for each person named (1) the association for which he estimated or enumerated (2) whether a member of the association (3) what was estimated or enumerated and (4) the dates for which he estimated or enumerated for the particular association.

Exhibit 2

UNITED STATES OF AMERICA BEFORE FEDERAL TRADE COMMISSION

Commissioners: Miles W. Kirkpatrick, *Chairman*; Paul Rand Dixon; Everette MacIntyre; Mary Gardiner Jones; David S. Dennison, Jr.

RESOLUTION DIRECTING USE OF COMPULSORY PROCESS IN NONPUBLIC INVESTIGATION

File No. 711 0042.

Nature and Scope of Investigation: The purpose of the authorized investigation is to develop facts relating to the acts or practices of the following corporations, Continental Oil Company, Gulf Oil Corporation, Mobil Oil Corporation, Shell Oil Company, Standard Oil Company, California, Humble Oil & Refining Company, The Superior Oil Company, Inc., Texaco, Inc., and Union Oil Company of California, to determine whether said corporations, and other persons and corporations, individually or in concert, are engaged in conduct in the reporting of natural gas reserves for Southern Louisiana which violates Section 5 of the Federal Trade Commission Act, or are engaged in conduct or activities relating to the exploration and development, production, or marketing of natural gas, petroleum and petroleum products, and other fossil fuels in violation of Section 5 of the Federal Trade Commission Act.

The Federal Trade Commission hereby resolves and directs that any and all compulsory processes available to it be used in connection with this investigation.

Authority to Conduct Investigation:

Sections 6, 9, and 10 of Federal Trade Commission Act, 15 U.S.C. 46, 49, 50; FTC Procedures and Rules of Practice 16 C.F.R. 1.1, et seq. and supplements thereto.

By direction of the Commission.

[SEAL]

——— ———,
Secretary.

Dated: June 3, 1971.

Exhibit 3

UNITED STATES OF AMERICA, BEFORE FEDERAL TRADE COMMISSION

File No. 711 0042

Commissioners: Miles W. Kirkpatrick, *Chairman;* Paul Rand Dixon; Everette MacIntyre; Mary Gardiner Jones; David S. Dennison, Jr.

In the Matter of The American Gas Association, Inc., et al.

OPINION OF THE COMMISSION

This matter is before the Commission on motions of the eleven companies subpoenaed, filed with the Secretary, to quash subpoenas duces tecum. The subpoenas were issued pursuant to Commission resolution dated June 3, 1971, which directed the use of compulsory process in a nonpublic investigation to determine whether petitioners and other persons and corporations, individually or in concert, are engaged in conduct in the reporting of natural gas reserves for Southern Louisiana which violates Section 5 of the Federal Trade Commission Act, or are engaged in conduct or activities relating to the exploration and development, production, or marketing of natural gas, petroleum and petroleum products and other fossil fuels in violation of Section 5 of the Federal Trade Commission Act. The subpoenas were signed by Owen M. Johnson, Jr., Assistant Director, Bureau of Competition.

The combined arguments of the subpoenaed corporations alleges in support of the motions that:

(1) exclusive and primary jurisdiction in the area of the investigation rests with the Federal Power Commission, which is currently exercising that power; the petitioners' actions, even if collective, are protected from antitrust attack by the *Noerr-Pennington* doctrine; the Commission should terminate, or alternatively, stay its nonpublic investigation of the reporting of natural gas reserves for Southern Louisiana;

(2) the demands of the subpoena are unduly broad, vague, burdensome and irrelevant;

(3) the Commission has failed to comply with the requirements of the Federal Reports Act of 1942;

(4) the documents are confidential, and not adequately protected from disclosure by the Commission's procedures;

(5) the resolution fails to advise petitioners of the scope and purpose of the investigation;

(6) delegation to an Assistant Bureau Director of authority to issue subpoenas is unlawful;

(7) the Commission's Rules of Practice deny witnesses the right to adequate representation by counsel, as guaranteed by the Constitution and the Administrative Procedure Act;

(8) the subpoena requires production of documents under the control and possession of petitioners' subsidiaries and affiliates, which petitioners have no right to produce.

A number of petitioners also request permission to obtain copies of and to reply to any memoranda, comments or recommendations of the Commission's staff in support of the subpoena, and opportunity to present oral argument. Many also request an extension of time to comply with the subpoena, and reserve the right to seek protective orders. One petitioner requests substitution of parties responding to the subpoena.

Exclusive and primary jurisdiction in the area of the investigation rests with the Federal Power Commission, which is currently exercising that power

Petitioners contend that this Commission is precluded from conducting the present investigation because the investigation represents duplication of Federal Power Commission efforts. The Commission's investigation, however, is targeted on possible violations of the antitrust laws and Section 5 of the Federal Trade Commission Act—activities over which the Federal Power Commission lacks jurisdiction. *California* v. *Federal Power Commission*, 369 U.S. 482 (1962).

The Natural Gas Act 15 U.S.C. §§ 717 et seq. (1963), grants the Federal Power Commission jurisdiction to establish just and reasonable rates for natural gas companies and to certify mergers between such companies. 15 U.S.C. § 717c, d and f. The Act does not expressly immunize gas producers subject to Federal Power Commission jurisdiction from the antitrust laws. It also does not authorize the Federal Power Commission to enjoin unfair methods of competition or unfair or deceptive acts or practices. The Act clearly does not confer authority upon the Federal Power Commission to proceed against conspiracies or practices which may constitute unfair or deceptive acts or practices. When the Federal Power Commission encounters an antitrust violation, it "may transmit such evidence as may be available concerning such acts or practices or concerning apparent violations of the Federal antitrust laws to the Attorney General, who, in his discretion, may institute the necessary criminal proceedings." 15 U.S.C. § 717s(a). Thus, while the Federal Power Commission may enjoin or modify rates it has approved, it may not approve of the acts of conspirators and it may not enjoin a conspiracy. The ratemaking authority of the Federal Power Commission is insufficient to cure violations of the antitrust laws.

This Commission, on the other hand, is specifically charged with enforcement of antitrust laws, both through the Clayton Act and through the broad jurisdictional grant of Section 5 of the Federal Trade Commission Act.

It is well settled that exceptions from the antitrust laws must be specific, and that repeals of authority by implication are not favored. *Silver* v. *New York Stock Exchange*, 373 U.S. 341 (1963). *George* v. *Pennsylvania R. Co.*, 324 U.S. 439 (1945). Where, as here, there is neither exemption nor immunity granted to the natural gas companies, none should be read into the statutes. Clearly, a reasonable rate approved by the Federal Power Commission is legal even though it may be demonstrable that the rate was fixed through concerted action by the producers. Despite the legality of the rate, however, any alleged underlying conspiracy is not beyond the reach of a specific grant of authority to enforce the antitrust laws. See *California* v. *Federal Power Commission, supra; United States* v. *R.C.A.*, 358 U.S. 334 (1959); *Georgia* v. *Pennsylvania R. Co., supra; United States* v. *Borden Company*, 308 U.S. 188 (1939); *Keogh* v. *Chicago & N.W. Ry. Co.*, 260 U.S. 156 (1922).

It is clear, therefore, that in the absence of an express exemption or immunity either in statutes or in court decisions, the Federal Trade Commission, as an agency charged specifically with the duty to enforce the antitrust laws, may proceed against alleged antitrust violations although another body may, even must, consider the same underlying facts for difference purposes. In the well-known Federal Trade Commission case of *American Cyanamid Company* v. *Federal Trade Commission*, 363 F.2d 757 (6th Cir. 1966), the court held that the requirement of the Patent Office to consider the truthfulness of representations before it, in granting or denying applications, did not preclude the Federal Trade Commission from investigating alleged fraudulent misrepresentations to the Patent Office if such misrepresentations would violate the Federal Trade Commission Act. Thus, the fact that the Federal Power Commission considers reserve estimates and procedures in its ratemaking function does not preclude this Commission from investigating the same estimates and procedures in an investigation of possible violations of Section 5 of the Federal Trade Commission Act, unless it constitutes part of a "regulatory scheme."

The mere duty of the Federal Power Commission to consider antitrust policies in the setting of rates has been held not to constitute part of a regulatory scheme, and not sufficient to displace the antitrust laws. *California* v. *Federal Power Commission, supra.* Those agencies and courts with specific authority to enforce antitrust laws have primary jurisdiction in proceeding against antitrust violations. *United States* v. *R.C.A., supra; Georgia* v. *Pennsylvania R. Co., supra; Silver* v. *New York Stock Exchange, supra.* As the Supreme Court said in *United States* v. *R.C.A., supra:*

"At the same time, this Court carefully noted that the doctrine [of primary jurisdiction] *did not* apply when the action was only for the purpose of dissolving the conspiracy through which the allegedly invalid rates were set, for in such a case there would be no interference with rate structures or a regulatory scheme." (*Id*, at 347: emphasis added.)

Clearly, on the basis of the foregoing authorities, this Commission has jurisdiction to conduct an investigation of alleged antitrust violations by gas producers. There is no express exemption or immunity from conspiratorial conduct granted to the industry either by the Natural Gas Act or the Federal Trade Commission Act. The general requirement of the Federal Power Commission to weigh antitrust considerations in its rate determinations is not sufficient to displace the specific grant of authority in the Federal Trade Commission to determine antitrust violations and does not evidence a regulatory scheme inconsistent with the objectives of this investigation. The assertions to the contrary provide no basis for quashing the subpoenas.

Another jurisdictional argument is that the Commission has no jurisdiction to investigate or proceed against conduct which is per se economically impractical. The basis for this contention is the assertion that no oil company interested in continuing the sale of natural gas would deliberately underreport natural gas reserves because of its deleterious effect on the ability to compete, and on the ability to finance, not to mention the liability under the securities laws. The mere statement of the proposition demonstrates its absurdity.

One petitioner contends that on the basis of the Noerr-Pennington doctrine, collective efforts on the part of natural gas industry members to secure favorable decisions from the Federal Power Commission are immune from prosecution under the antitrust laws. Even assuming the correctness of the interpretation, immunity from prosecution under the antitrust laws cannot by virtue of *Noerr* be held to extend to collusive filing of false information with the Federal Power Commission. *Woods Exploration and Producing Company* v. *Aluminum Company of America*, 438 F.2d 1286 (5th Cir. 1971), *cert. denied*, — U.S. — (1972). *See also, Trucking Unlimited* v. *California Motor Transport Co.*, 432 F.2d 755 (9th Cir. 1970), *aff'd*, — U.S. — (1972); *Eastern Railroad Presidents Conference* v. *Noerr Motor Freight, Inc.*, 365 U.S. 127 (1961). The Federal Power Commission itself lacks the authority to proceed under the antitrust laws against alleged collusive deception. *California* v. *Federal Power Commission, supra.* Therefore, *Noerr* cannot be interpreted to preclude the Commission from conducting the instant investigation to determine whether or not movant or other natural gas companies may be violating the antitrust laws and Section 5 of the Federal Trade Commission Act.

Several petitioners make the argument that the Commission should terminate, or alternatively, stay its nonpublic investigation of the reporting of natural gas reserves for Southern Louisiana. The grounds cited by movants relate to various audits of reserves purportedly performed by the Federal Power Commission. Questions regarding the collection of similar data by two agencies for different purposes relate to comity rather than to jurisdiction. They provide no basis for termination of the present investigation. This leaves only the question as to whether the Federal Power Commission has investigated and obtained evidence which the Federal Trade Commission staff can profitably use in its present investigation and can reasonably obtain. Movants cite three such instances: systematic investigations and periodic audits of gas reserve data by the Federal Power Commission; the Uncommitted Reserves Study; and the National Gas Survey.

The only systematic investigations and periodic audits undertaken by the Federal Power Commission that this Commission has been able to ascertain relate to applications filed with the Federal Power Commission for certification to construct pipelines. If certification is obtained, reserves dedicated to those pipelines must be reported annually on Federal Power Commisison Form 15. This data, however, is not of much use in the present investigation. First, the figures relate only to reserves which have been slated for shipment through the particular pipelines, (this does not include, for instance, the gas which will not be shipped in interstate commerce). Such figures are in no way equivalent to the proved reserves estimates of the producers themselves. Producers have been adamant in showing that the dedicated reserves differ from proved reserves and cannot be used to check the accuracy of the latter. Not only are they based upon shipment figures, state the producers, but they also may be based upon a different geological measurement system. As to producer data supplied to the Federal Power Commission, the only available figures are the final proved reserves estimates, which are channeled through the American Gas Association, and which we have also. The producers do not provide any underlying data upon which the estimates are made, so that the Federal Power Commission has no underlying data available with which we could check the accuracy of the reporting.

It is also contended that the information gathered in preparing the South Louisiana rate proceedings, AR69–1, and in the subsequent Uncommitted Reserves Study, track the data that we seek and that the Federal Power Commission determined at that time that the reserve estimates were "reasonably reliable for the purposes used." It is urged that we defer to the Federal Power Commission expertise in this area. But first, the Federal Power Commission reserves study was by no means complete, having been reduced from the originally planned audit of all reserves to an audit only of uncommitted reserves. Secondly, the underlying data which were to be available to the Federal Power Commission were kept at the offices of the producers, and are unavailable to us. Third, the questionnaires were never made public and were returned to the producers. No data was removed from the offices of producers and the workpapars of the auditing were destroyed. There would appear, therefore, to be no material upon which comity might work.

In addition, the Federal Power Commission had no procedure nor did it perform any kind of audit to determine whether the producers reporting reserves had reported all of their uncommitted reserves, nor was an investigation made to determine if all companies holding reserves in off-shore South Louisiana had filed questionnaires.

The Federal Power Commission Uncommitted Reserves Study did not set out to check the accuracy of American Gas Association proved reserve figures, but only the accuracy of certain producer figures compiled for one occasion. It is clear that the Federal Trade Commission cannot rely upon the accuracy of the final determination involved here, and it is equally clear that the underlying data are not available for Federal Trade Commission examination from the Federal Power Commission.

Finally, the argument is made that the Federal Power Commission is presently conducting a Natural Gas survey for the specific purpose of auditing gas reserves, and that this Commission should stay its investigation pending completion of that study, in order to use the results gained from that study. But first, this Commission's investigation was begun substantially before that of the Federal Power Commission. Second, the Federal Power Commission study will not be adequate for our purposes. The study will be done on a random sampling basis; data will be evaluated only in company offices; the independent reserve team-generated worksheets will be preserved in the companies' offices until July 1, 1974. And there will be no cross-referencing of data from one company to another, as all reserve estimates on individual fields will be available only to the independent accountant working with the data on an individual firm. The study will cover only one year, 1970, and will miss the crucial years in our investigation, 1968 and 1969. Finally, selection of the fields for study has not been done or even scheduled to be done, so it will be impossible to determine the extent of overlap for some time. Under the circumstances, we think it unneccessary to postpone our investigation in anticipation of the Federal Power Commission's study.

The demands of the subpoena are unduly broad, vague, burdensome and irrelevant

a. Petitioners contend in various ways that the scope of the specifications is too broad. Some specifically exempt certain specifications from the charge (particularly A–D), but most condemn all the demands with such sweeping objections as that the subpoena "would call for every piece of paper conceivably related to the production and exploration of natural gas," that it is "nearly as broad as the

Federal Trade Commission's vast potential Section 5 jurisdiction," and that it is "intended to cover every conceivable kind of document or record on paper, card, film or magnetic tape," or "sweeps across the entire range of [movant's] natural gas operations."

The petitioners, however, read the subpoena too broadly, for it displays no undue breadth of demand. The subpoena seeks specific information relating to the reporting practices of a portion of petitioners' total operations in a specifically defined geographic area through the use of terms clearly defined throughout the industry and clearly relevant to the investigation at hand.

One petitioner argues that a time period of, in some instances, a decade over which documents are demanded is too broad and burdensome.

It is clear that in an antitrust investigation such as the present one a time span of ten years is not at all unusual. Such a period of time is needed for the proper development and analysis of the pattern of behavior and of any change during that period.

It is also contended that no time frame is given for Specifications E and H. However, Specification E is worded in the present tense and demands information as to present customers and distribution methods, and H is clearly based upon Specification G and the time periods therein.

b. Several movants claim that certain of the specifications are overly vague. Arguments are made, for instance, that Specifications G, I, J and K are so vague and indefinite as to render the subpoena unenforceable because documents are demanded which "relate" to named items. Thus, these specifications call for a judgment decision by the movants "as to what is too remote." While subpoena demands must, of course, be reasonably clear, the specificity of the demands must be balanced against the agency's knowledge of what documents exist and in what form. It is clear that at the investigational stage the Commission lacks specific knowledge of the existence of particular documents.

In any case, the documents called for relate to specific categories of information. Each category pertains to a clearly defined factual situation relevant to the Commission's inquiry. That is all an investigatory subpoena need provide.

Other movants challenge Specification K(2)'s demand for production of documents relating to "lower proved reserves," because it provides no comparative basis. It is clear from the entire specification that documents are sought which reflect differences between the figures submitted to the American Gas Association and the possibly higher ones in these movants' own files which are used for other purposes.

Questions are also raised as to what "unit" means. That term refers to the standard measurement of reserves as reported to the American Gas Association, Federal Power Commission and others. The most usual industry measurements are MCF, BCF and TCF (millions, billion, and trillions of cubic feet), as measured at sixty degrees fahrenheit and 14.73 psi (pounds per square inch). Any of these measurements, consistently used, is satisfactory.

c. Movants urge burden of compliance in several respects. Most movants argue that the large volume of documents, as well as their geographic dispersal, constitute the unreasonable burdensomeness of the demand. However, it is well settled that a subpoena will be enforced if on its face it is reasonably relevant to the investigation. *Federal Trade Commission* v. *Menzies*, 145 F. Supp. 164, 170 (D.C. Md. 1956). *aff'd*, 242 F.2d 81 (4th Cir.), *cert. denied*, 353 U.S. 957 (1957); *Fleming* v. *Fidelity-Philadelphia Trust Company*, 248 F. Supp. 487, 493 (E.D. Pa. 1965). The general relevance of the demands is evident, and relevance of the technical data demand will be established *infra*. The search that may be necessitated by the subpoena does not result, therefore, from any impropriety in the demands made, but rather from the application of reasonable demands to a large and widespread corporation. The breadth of the search is found in movants' operations, not in the demands of the subpoena. The inconvenience that movants may suffer from having the subpoenaed data widely dispersed throughout its corporate division must yield to the public interest. *Wirtz* v. *Local 875, International Brotherhood of Teamsters, Chauffers, Warehousemen, and Helpers of America*, 216 F. Supp. 798, 800 (E.D.N.Y. 1963). As Judge Weinfeld succinctly stated in *Application of Radio Corporation of America:*

"But the great number of documents called for are an inevitable concomitant of RCA's gigantic size, the broad scope of its far-flung operations and the nature of its corporation structure. The magnitude of RCA's activities and the fact that some of its activities have been decentralized, with the consequent dispersal of records in various places, hardly serves as an excuse for denying the Grand Jury the right to inspect documents required by it in the furtherance of its duty.

"*Inconvenience is relative to size.* Any witness who is subpoenaed suffers inconvenience. An individual operating a small business, for example, or a corporation operated by a sole shareholder, may suffer, in like circumstances more inconvenience than the movant with its thousands of employees. But this inconvenience, whether suffered by a witness, grand jurors, or jurors is part of the price we pay to secure the effective administration of justice and the enforcement of our laws." (Emphasis added.) *Application of Radio Corporation of America*, 13 F.R.D. 167, 171–172 (S.D.N.Y. 1952) ; *see also, Oklahoma Press Publishing Company* v. *Walling*, 321 U.S. 186 (1946).

A number of petitioners contend that the thirty-day time period given for response to the subpoena is unreasonable. The reasonableness of the time allowed for compliance with the subpoena is best left for resolution between petitioners and Commission staff pursuant to Section 2.7 of the Commission's Rules of Practice.

d. Several petitioners contend that the subpoena is unreasonable in that it requires production of technical and nonproduction data related to the companies' estimates of natural gas reserves which are beyond the competence of the Commission to interpret. and are irrelevant to any investigatiton of possible violations of the antitrust laws. Technical data underlying the companies' reported estimates of natural gas reserves are clearly relevant. As discussed *infra* p. 21, the purpose of the investigation is to determine whether the companies, individually or collectively, are engaged in activities which violate Section 5 of the Federal Trade Commission Act in the context of the activities defined by the resolution. Underlying data are essential to enable the Commission to determine the accuracy of such estimates and the soundness of the companies' reporting procedures and to assist the Commission in evaluating the companies' conduct in connection with the exploration, development, production and marketing of natural gas. Even assuming that the data is "highly technical," as is claimed, this does not preclude the Commission from conducting its investigation. It represents a curious situation at best for an investigated party to assert, as barring investigation, the complexity of the matters investigated. The ability of an agency to evaluate information sought has been and continues to be necessarily a factor totally irrelevant to the legitimacy of investigational demands.

One petitioner objects to the relevance of the subpoena specifications calling for information relating to the sale and net production of natural gas. and to the reporting and estimating activities that precede exploration, development, purchase or sale of explorable acreage. The former category of information is relevant to the investigation at hand because of the necessity and desire to determine whether public interest exists from the magnitude of the sale of natural gas. The latter category of information regarding other. less-direct methods of estimating gas reserves is relevant from a comparative standpoint because of the potential correlation in this type of gas reserve estimation and ultimate gas reserve reporting.

The Commission failed to comply with the requirements of the Federal Reports Act of 1942

Movants contend that identical subqoenas were issued to more than ten companies asking for identical information, and that the demand must, therefore, be submitted to the Office of Management and Budget according to the provisions of the Federal Reports Act (44 U.S.C. §§ 3501, *et seq.*). Section 5 of the Act (44 U.S.C. § 3509) provides:

"A Federal agency may not conduct or sponsor the collection of information upon identical items, from ten or more persons, other than Federal employees, unless, in advance of adoption or revision of any plans or forms used in the collection—

"(1) the agency has submitted to the Director the plan or forms. together with copies of pertinent regulations and of other related materials as the Director of the Bureau of the Budget has specified, and

"(2) the Director has stated that he does not disapprove the proposed collection of information."

The Commission believes that this section of the United States Code is not applicable to the issuance of administrative subpoenas for law enforcement purposes, and that clearance from the Director of the Bureau of the Budget (now Office of Management and Budget) need not be sought.

A threshold determination in ascertaining the applicability of the Federal Reports Act involves a determination whether issuance of this administrative subpoena constitutes a "collection of information" within the meaning of Section 5 of the Act. The term "information" has been given a word-of-art definition for purposes of the Act. Section 3502 of Title 44 defines the term as follows:

"As used in this chapter—

* * * * * * *

" '[I]nformation' means facts obtained or solicited by the *use of written report forms, application forms, schedules, questionnaires, or other similar methods* calling either for answers to identical questions from ten or more persons other than agencies, instrumentalities, or employees of the United States or for answers to questions from agencies, instrumentalities, or employees of the United States which are to be used for statistical compilations of general public interest." (Emphasis supplied.)

Obviously, the mere existence of the above-quoted definition substantiates congressional intent to limit the definition of the common word "information." The construction of the definition most applicable and favorable to petitioner's argument that subpoenas are covered reads as follows:

" '[I]nformation' means facts obtained or solicited by . . . [various forms and questionnaires] . . . calling . . . for *answers to identical questions* . . . ." (Emphasis supplied.)

The subpoena, like all Commission subpoenas, does not ask questions. It is not a written report form, questionnaire, application form, schedule or other document calling for the formulation or an answer. Compliance with a subpoena and a return thereunder does not require the formulation or expostulation of an answer.

All that an administrative subpoena requests are *documents*. It is well-settled law that a subpoena may not compel a party to prepare any documents or other information for the purpose of the subpoena. In short, the documents sought by a subpoena must exist prior to the date of return under the subpoena, and need not be prepared in response thereto. Thus, a return of documents under a subpoena is not the obtaining of "facts obtained or solicited by use of written report forms * * * for answers to identical questions from ten or more persons other than agencies, instrumentalities, or employees of the United States . . . ."

There is another reason why the Commission is not required to seek Bureau of the Budget (now Office of Management and Budget) clearance for the issuance of the subpoena in question. The Federal Reports Act is limited by its literal terms to the collection by federal agencies of information in the nature of the reports intended "to be used for statistical compilations of general public interest." (44 U.S.C. § 3509.) Hence, it does not govern the investigatory activities of the Federal Trade Commission seeking by compulsory process to determine whether any of the laws it administers have been violated.

The validity of this contention is demonstrated by the definitional concern toward limiting the term "information." The final clause of that definition modifies the term "facts" as applied to the meaning of "information." Thus, the appropriate phraseology of the definition of "information" (with omission for clarity) is:

" '[I]nformation' means facts . . . (obtained by various methods) . . . *which are to be used for statistical compilations of general public interest.*" (Emphasis supplied.)

Although the precise meaning of this definitional phrase is not reflected in the legislative history of the Act, other sections of the Federal Reports Act verify that the Act was not intended to encompass the use of compulsory process by independent regulatory agencies. Section 3506 (44 U.S.C. § 3506) provides that any party having a substantial interest may request that the Director of the Bureau of the Budget (now Director, Office of Management and Budget) determine ". . . whether or not the collection of information by a Federal agency is necessary for the proper performance of the functions of the agency or for any other proper purpose." The appropriateness of this section in instances not involving alleged violations of law is manifest. It enables a business to obtain relief from an otherwise burdensome information collection process. However, the rights afforded under this section, when applied to alleged violations of law, produce an absurd and inconsistent result.

Application of Section 3506 to law enforcement efforts of independent regulatory agencies world provide a corporation or business entity the opportunity for frustration of the statutory purpose found, for example, in the Federal Trade

Commission Act. That section vests in the Director of the Bureau of the Budget (now Office of Management and Budget) the authority to determine the necessity for the collection of information. If found unnecessary, the Act bars the agency so found from further collection of this information.

Thus, if we accept petitioner's construction of the Federal Reports Act, it would mean that the very person who is being investigated for possible law violations may appeal to, and obtain a hearing by, the Bureau of the Budget (now Office of Management and Budget) on the nature of the compulsory process used, before the federal agency concerned may obtain by its compulsory process investigatory facts needed to determine whether the laws it enforces have been violated. Congress surely never intended to subject to executive review the use of compulsory process in investigations to determine law violations. However, if we accept petitioner's argument, in effect the now Office of Management and Budget has plenary, unappealable power to determine whether compulsory process "is necessary" for proper effectuation of the Commission law enforcement, investigatory functions.

We believe the point made above goes to the very heart of the determination of the applicability of the Federal Reports Act, and requires reemphasis: If Congress had sought such anomalous results by passage of the Federal Reports Act, the intention would have been clearly manifest somewhere in the legislative process.

No such intent appears either in the statutes or in its legislative history. 82 Stat. 1302, 5 U.S.C. § 3501; *see* Conference Report on this bill, reproduced at 88 Cong. Rec. 9434–9435 (December 10, 1942); *see also* Senate Report No. 1651, 77th Cong., 2d Sess. (1942). Virtually every relevant legislative interpretation either expressly or implicitly indicates that the information sought for proscription under this Act does not include that which is a necessary adjunct to the discharge of law enforcement responsibilities and which bears directly on an ascertainment of alleged law violations. Accordingly, we do not accept petitioner's argument that the Federal Reports Act applies to compulsory process issued by the Federal Trade Commission for law enforcement purposes.

The documents are confidential, and the subpoena and the Commission's procedures do not adequately protect them from disclosure

Movants contend that much of the information demanded consists of highly confidential trade secrets such as bidding procedures and estimates of natural gas in the fields.

The alleged confidential nature of documents, however, does not preclude their inspection and examination by the Commission and provides no basis for limiting or quashing a subpoena. *Federal Trade Commission* v. *Tuttle*, 244 F.2d 605 (2d Cir. 1957), *cert. denied*, 354 U.S. 925 (1957); *Federal Trade Commission* v. *Green*, 252 F. Supp. 153 (S.D.N.Y. 1966). Documents received during a nonpublic investigation such as this are not a matter of public record, but instead constitute part of the confidential records of the Commission, pursuant to Section 4.10 of the Commission's Rules. Under Section 10 of the Federal Trade Commission Act, any officer or employee of the Commission who makes public any information without authority of the Commission or by direction of court is guilty of a misdemeanor and subject to criminal sanctions.

The confidential nature of the documents thus provides no basis for quashing the subpoena.

One movant goes to extremes and contends that disclosure of information to the Commission is tantamount to disclosure to competitors, and that this would reduce competition in violation of the antitrust laws. The argument is patently ridiculous. Such an unfounded assumption of disclosure of information received would, if taken seriously, bring into question all Commission proceedings.

The resolution fails to advise the scope and purpose of the investigation

It is next contended that the resolution of June 3, 1971, is vague and ambiguous, encompassing almost any violation of the very broad sweep of Section 5 of the Federal Trade Commission Act. In support of the argument, movants refer to the several cases in which courts have felt compelled to quash compulsory process issued pursuant to an unlawfully vague resolution. The principal ones cited are *Montship Lines, Ltd.* v. *Federal Maritime Board*, 295 F.2d 147 (D.C. Cir. 1961); *Hellenic Lines, Ltd.* v. *Federal Maritime Board*, 295 F.2d 138 (D.C. Cir. 1961). In those cases, however, there was either no statement of purpose or merely a statement that the investigation was being carried on pursuant to certain statutory authority.

The scope of the present investigation is clearly marked out by the terms of the resolution which specify the identity of the companies under investigation, the specific products involved, and the particular acts and practices of the companies to be investigated. The purpose of the investigation, as indicated in the resolution, is to determine whether the companies, individually or collectively, are engaged in activities violative of Section 5 of the Federal Trade Commission Act in the context of the activities defined by the resolution. The argument is also made that the resolution does not authorize investigation into areas outside South Louisiana because it specifically mentions reserve reporting for that area. However, the resolution expressly covers conduct or activities relating to the exploration or development of natural gas without any limitation as to geographical area. The very object of gas exploration is to uncover gas reserves, which then become company assets to be used in various ways, including being reported to the American Gas Association. The reporting of gas reserves is thus directly related to exploration and development and, as such, is authorized by the resolution. Moreover, the terms of the subpoena make it abundantly clear as to precisely what acts and practices of the petitioner are under investigation. *See also, Federal Trade Commission* v. *Green, supra.*

Delegation to an assistant bureau director of authority to issue subpoenas is unlawful

Movants contend that the Commission is without power to delegate the authority to issue subpoenas. It is clear that Reorganization Plan No. 4 of 1961, 26 Fed. Reg. 6191 (1961), 72 Stat. 837, 5 U.S.C.A. § 1, provides the Commission with authority to delegate its functions to employees. Pursuant to such authority the Commission, on April 8, 1970, 35 Fed. Reg. 5753, amended 35 Fed. Reg. 10627, by general delegation, and by Section 2.7(a) of the Rules of Practice and Procedure, 35 Fed. Reg. 5681, expressly delegated the authority to issue.

The validity of such a delegation has recently been upheld by the 5th Circuit Court of Appeals. *Federal Trade Commission* v. *Gibson*, 1972 Trade Cas. Par. 73,985 (5th Cir. May 19, 1972). In its decision, the court squarely faced and flatly rejected contentions identical in all material respects to those raised by Movants in this investigation. It determined with regard to a parallel delegation to field office officials that "[T]he authority to issue investigative subpoenas duces tecum was properly and unequivocally delegated. . . ." In reaching this conclusion, the court specifically found that the Commission's power to make such a delegation is derived from Reorganization Plan No. 4 of 1961. It is clear the Commission may properly delegate the authority to issue subpoenas, and Movants' arguments to the contrary are patently without merit.

One Movant asserts that the Commission's efforts to delegate its subpoena powers have thus permitted and resulted in an oppressive and unreasonable attempt by the staff to oppress business. This argument likewise is without merit. The retention by the Commission of the ability to review motions to quash evidences the fact that Movant's arguments as to uncontrolled abuse are groundless.

The Commission's rules of practice deny witnesses the right to adequate representation by counsel, as guaranteed by the Constitution and the Administrative Procedure Act

Petitioners contend that Rule 2.9 purports to limit the right of representation by counsel in substantive ways and that this contravenes both the Administrative Procedure Act and the Constitution. It is unquestionable that the Administrative Procedure Act, 5 U.S.C. § 555, applies and a witness responding to a Commission subpoena is entitled to be accompanied, represented, and advised by counsel. The Commission's rule so provides, and the cases cited by counsel to the contrary are irrelevant because they deal with investigational hearing procedures employed prior to the adoption of present Rule 2.9.*

**Wanderer* v. *Kaplan,* 1962 Tr. Cas. Par. 70.535 (D.D.C. 1962) ; *Hall* v. *Lemke,* 1962 Tr. Cas. Par. 70,338 (N.D. Ill. 1962).

Petitioners contend that Rule 2.9 denies counsel "any right to challenge the Commission's authority to conduct the investigation or to challenge the legality or sufficiency of the subpoena" before the presiding official and is therefore in direct conflict with *Anheuser-Busch Inc.* v. *Federal Trade Commission*, 359 F.2d 487 (1966). Rule 2.9(b)(4), however, does not deprive counsel of the right to make such a challenge before the presiding official; it merely establishes the procedure in accordance with which objections must be made. Motions challenging either the Commission's authority to conduct an investigation or the legality or sufficiency of the subpoena must be directed first to the Commission in accordance with Rule 2.7. In the event the motion is denied and counsel wishes to continue the challenge, he may file a copy of the motion with the presiding official as part of the record of the investigation. and he may refuse to produce the documents demanded on the grounds stated in the motion.

Clearly then. a challenge to the subpoena may be made before the presiding official without reargument of any ground relied upon in the motion addressed to the Commission. In *Anheuser-Busch* the court stated:

"[t]he hearing officer has no statutory power to enforce compliance or to impose sanctions. Instead, to enforce the summons, the Commission must seek the assistance of a court.

"It is this resort to the federal court which, . . . is the 'adversary proceeding affording a judicial determination to the challenges to the summons and giving complete protection to the witness.' "

It is clear that Rule 2.9(b)(4) is not in conflict with this decision, and movants' reasoning to the contrary is not supportable.

Moreover, the present rule constitutes full representation in accordance with Administrative Procedure Act standards. It provides that movant may be "accompanied, represented, and advised" by counsel at the investigational hearing when return is made under the subpoena. At the hearing, counsel may consult with his client either on his own initiative or at the request of his client. If the witness refuses to answer any questions on advice of counsel or on his own initiative, counsel may briefly state the legal grounds for the refusal. Further, if it is claimed that any testimony is outside the scope of the investigation or the witness is privileged to refuse to answer, counsel may state briefly the grounds of such claims. Following completion of the questioning of any witness, counsel may request the presiding official at the investigational hearing to permit the clarification of any answer given in order that it "may not be left equivocal or incomplete on the record." This procedure permits counsel to state on the record reasons why the witness' testimony is equivocal or incomplete and why clarification may be necessary to understand the meaning of an answer given in response to a particular question. The fact that a presiding official may deny the request does not in any way deprive the witness of his right to effective representation by counsel.

Finally, as to one petitioner's argument that refusal to answer questions may result in the imposition of criminal sanctions, such action may be taken only through a court proceeding wherein the respondent may raise his objections anew.

Although Rule 2.9 does not permit counsel to testify on behalf of his client, it does provide for full representation by counsel in compliance with the requirements of the Administrative Procedure Act. Accordingly, the arguments raised as alleged deficiencies in the rule provide no basis on which to quash these subpoenas.

The subpoena requires production of documents from the files of movants' subsidiaries and affiliates

Some petitioners further object to the subpoena on the ground that it requires them to produce documents within the custody and possession of independently operated subsidiary corporations which they own or control. They argue that such documents are not within their control and are, therefore, beyond the reach of the subpoena.

In *In re Investigation of World Arrangements*, 13 F.R.D. 280 (1952), the court considered and rejected an argument substantially similar to that which movant urges upon the Commission. The court stated:

"The position of the movants is that they cannot reach the files of their own subsidiaries unless they are available 'free of the necessity of securing the consent of others.' It is inescapable that the 'others' can only mean the corporations' own subsidiaries. A corporation, be it the parent corporation or the subsidiary corporation, functions under the guidance of its directors. Therefore, if a corporation has the power, either directly or indirectly through another corporation or a *series* of corporations to elect a majority of the directors of another corporation, such corporation may be deemed a parent corporation and in control of the corporation whose directors it has the power to elect to office. If any corporation herein under the subpoena duces tecum has that power it has the control necessary to secure the documents demanded by the government."

When a parent company is served with a subpoena, it is no defense to claim that the information is within the possession of a wholly owned subsidiary, because such a corporation is owned and controlled by the parent. *See generally, Westinghouse Credit Corp.* v. *Mountain States Mining and Milling Co.*, 37 F.R.D. 348, 349 (1965).

No petitioner making these assertions contends that it lacks the power, either directly or indirectly, to choose a majority of the directors of its subsidiary corporations, *see generally, Flank Oil Co.* v. *Continental Oil Co.*, 277 F. Supp. 357 (1967); and if such power exists, the petitioners have the control necessary to secure the documents demanded by the Commission's subpoena.

Requests to be provided with copy of staff memoranda supporting subpoena to reply thereto and to present oral arguments; requests for extension of time and substitution of parties

Many petitioners request permission to obtain a copy of and to reply to any memoranda, comments or recommendations of the Commission's staff in support of the subpoena, and an opportunity to present oral argument. However, since this matter is not at an adjudicatory stage, it does not involve the same due process considerations that otherwise apply. In the case of *Federal Trade Commission* v. *Hallmark, Inc.*, 265 F.2d 433 (7th Cir. 1959), the court discussed the point well:

" 'Adjudication' is defined by 5 U.S.C.A. § 1001(d) as meaning 'agency process for the formulation of an order.' The same section defined 'order' as meaning 'the whole or any part of the final disposition . . . of any agency in any matter other than rule making but including licensing.' The present investigation does not qualify as an adjudicative adversary process. . . . The investigation may eventually lead to an adjudicatory proceeding, but the investigation itself will result in no final disposition of the rights and duties of Hallmark." (*Id.* at 437.) *See also, Federal Trade Commission* v. *Waltham Watch Company*, 169 F. Supp. 614 (D. S.D.N.Y. 1959); *Federal Trade Commission* v. *Scientific Living*, 150 F. Supp. 495 (D. M.D. Pa. 1957).

The Commission is under no obligation to grant movants access to the "staff memoranda" in support of the subpoenas, nor does the Commission generally grant access to such documents. Staff communications to the Commission regarding a motion to quash an investigational subpoena constitute intra-agency memoranda and are thus exempt from disclosure under the Freedom of Information Act (5 U.S.C. § 552(b)). As the Fifth Circuit has held:

". . . intra-agency correspondence discussing the course of conduct to be followed by the parties and expressing opinions as to the merits of various claims presented to the agency enjoys at least a qualified privilege which, in the absence of special circumstances, shields it from examination by the public." *Davis* v. *Braswell Motor Freight Lines, Inc.*, 363 F.2d 600, 604–605 (5th Cir. 1966).

There are no special circumstances in this case. Staff communications regarding the recommended course of actions with respect to movants' motions do not in any way diminish movants' right to present their case. Movants' requests that they be permitted to respond to staff communications would result in needless delay, and accordingly, are denied.

Finally, several movants request leave to present oral argument on their motions. In view of the fact that the issues as set out in the motions and supporting memoranda appear comprehensive, oral argument would result in needless expense and delay. The requests, therefore, are denied. *Federal Trade Commission* v. *Hallmark, Inc., supra.*

The motions to quash the subpoenas are without merit, and, accordingly, are denied. Appropriate orders accompany this opinion. Any extension of time for response to the subpoena duces tecum may be negotiated with the staff attorneys, pursuant to Section 2.7 of the Commission's Rules. The same procedure will apply to requests for substitution of persons required to appear and testify in this investigation.

June 27, 1972.

Exhibit 4

Executive Office of the President,
Office of Management and Budget,
Washington, D.C., October 29, 1971.

Mr. Henry Lipsky,
Liaison Officer, Federal Trade Commission,
Washington, D.C.

Dear Mr. Lipsky: Your letter of October 28, 1971 asked if investigational subpoenas or subpoenas issued during litigation are subject to clearance by the Office of Management and Budget under the provisions of the Federal Reports Act of 1942.

The answer to your question is no, they are not.

If I may be of further help to you on this matter, please let me know.

Sincerely,

Roye Lowry,
Clearance Officer.

Exhibit 5

July 7, 1972.

Mr. O. N. Miller,
Chairman, Standard Oil Co. of California,
San Francisco, Calif.

Dear Mr. Miller: As you know, on June 27, 1972 the Commission denied Standard's motion to quash the Subpoena Duces Tecum issued to you on November 24, 1971, in the above matter.

Because of the substantial delay that has already occurred in this matter, we do not feel that a new deadline should be set for submission of your response to the subpoena until we are assured that you intend to comply fully with the subpoena's demands. Accordingly, you are directed to submit within twenty (20) days from the date of this letter, a statement indicating whether or not you intend to comply fully with said subpoena without resort to further legal proceedings.

Any questions concerning compliance with the subpoena should be addressed to Attorney Donald K. Tenney (202-962-7566).

Very truly yours,

Owen M. Johnson, Jr.,
Assistant Director,
Bureau of Competition.

Exhibit 6

Hogan & Hartson,
Washington, D.C. July 31, 1972.

Hon. Charles A. Tobin,
Secretary, Federal Trade Commission,
Washington, D.C.

Dear Sir: This is in response to the Commission's Order and Opinion denying the Motion of Standard Oil Company of California to Quash Subpoena Duces Tecum dated November 24, 1971 in the above captioned matter and to the letters from the Commission staff relating to that matter dated July 18, 1972 and July 20, 1972.

The subpoena seeks certain material which is relatively routine relating to the corporate organization of Standard but the principal thrust of the subpoena is to seek extremely extensive, technical and confidential documents relating to natural gas reserves. As we have indicated in our motion and in conversations with the Commission staff, Standard is, of course, quite willing to supply the routine material sought but it is obvious that the Commission is interested only in securing the extensive, technical, confidential material relating to natural gas reserves.

The Federal Power Commission has been established by Congress as the government agency to regulate natural gas companies and has regulated virtually all aspects of the operations of companies engaged in production and interstate distribution of natural gas. Over the years Standard has cooperated fully with the FPC, has disclosed all data to the FPC that were sought and has made every effort to cooperate entirely in the public interest and to maintain as adequate a supply of this dwindling natural resource to the public as resources permit. As you have been advised, the FPC has recently undertaken a survey of natural gas reserves. This is itself a very extensive inquiry which will involve many highly trained and technically qualified individuals and which will impose a substantial burden upon the companies responding. Standard is responding and will respond fully to this FPC inquiry, will cooperate with the FPC, and will furnish all data required by the FPC.

On the other hand, it is evident to us that the Federal Trade Commission is not authorized by Congress to duplicate the work of the FPC, that it is not technically qualified to handle the material sought by the subpoena that has been directed to Standard, and that there is every likelihood that it would be unable to maintain the confidentiality of the extremely important and valuable data relating to exploration and discovery of undeveloped natural gas reserves. It is our view that it is beyond the proper scope and jurisdiction of the FTC to seek this material, that it would be contrary to the public interest and inconsistent with the competitive purpose of the antitrust laws for such material to be delivered to the FTC, as sought by the subpoena, and that the subpoena is invalid for all of the reasons stated in detail with supporting argument and authority in the Motion to Quash and supporting material previously filed. It is our view that the Order and Opinion of the Commission relating to this matter are inadequate and unpersuasive and fail to meet the arguments and authorities cited in the Motion and supporting material.

Accordingly, you are hereby notified that Standard Oil Company of California does not intend to comply with the FTC subpoena dated November 24, 1971, and if enforcement is sought intends to contest the jurisdiction of the FTC and the validity of the subpoena by all available legal means.

Sincerely yours,

LEE LOEVINGER.

EXHIBIT 7

In the United States District Court for the District of Columbia

Civil Action No. ——

FEDERAL TRADE COMMISSION, PETITIONER

v.

O. N. MILLER, CHAIRMAN, AND STANDARD OIL COMPANY OF CALIFORNIA, A CORPORATION, *Respondents*

AFFIDAVIT OF DONALD K. TENNEY

DISTRICT OF COLUMBIA,
City of Washington, ss:

Donald K. Tenney, being duly sworn, deposes and says that:

1. I am a senior attorney in the Federal Trade Commission's Bureau of Competition and am one of the attorneys assigned to the Commission's investigation identified as File No. 711 0042.

2. In the course of performing my duties in the conduct of this investigation, I have made certain inquiries and have examined various portions of the files of the Federal Power Commission and the attachments hereto are true and accurate copies of the documents or portions of documents as described as follows:

Attachment A—cover page and pages 8, 15–19 66–68, 76–79, and 98 of deposition of B. B. Gibbs, Chairman of the South Louisiana Subcommittee of the American Gas Association, taken on August 5, 1971.

Attachment B—pages 1411–13, 1417 and 1422 of "prepared testimony" of John C. Jacobs, Jr., Chairman of the American Gas Association Committee on Natural Gas Reserves, given in Federal Power Commission *Area Rate Proceeidngs, et al.* (*Southern Louisiana Area*), Docket No. AR69–1.

Attachment C—pages 90–93 and 120 of joint report of American Gas Association, American Petroleum Institute, and the Canadian Petroleum Institute entitled *Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas in the United States and Canada as of December 31, 1969*, Vol. 24 (May 1970).

Attachment D—pages 1 and 8 of Federal Trade Commission December 28, 1970, questionnaire, letter to John C. Jacobs, Jr., Chairman of the American Gas Association Committee on Natural Gas Reserves and answers of Mr. Jacobs to questions 30(a) and 30(b) of that questionnaire.

Attachment E—Federal Power Commission Order Requiring Reporting of Specified Reserves Data and Prescribing Procedures, issued March 17, 1970 (43 FPC 444).

Attachment F—transcript pages 5190–92, 5196, 5200, 5430 and 5446 from hearings in Federal Power Commission *Area Rate Proceedings, et al.* (*Southern Louisiana Area*), Docket No. AR69–1, constituting excerpts of the testimony given by Lawence R. Mangen, Assistant Section Head of the Gas Supply Section, Federal Power Commission.

Attachment G—Federal Power Commission Order Authorizing the Establishment of National Gas Survey Advisory Committees and Prescribing Procedures, issued February 23, 1971.

Attachment H—Federal Power Commission Order Establishing Technical Advisory and Coordinating Committee Task Forces and Designating Membership, issued December 21, 1971, together with Appendix A thereto.

Attachment I—page 126 of joint report of American Gas Association, American Petroleum Institute, and the Canadian Petroleum Institute entitled *Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas in the United States and Canada as of December 31, 1968*, Vol. 23 (May 1969).

3. Gulf Oil Company has submitted over 12,000 documents constituting what it claims to be a complete submission of the subpoena *duces tecum*. Union Oil Co. of California has likewise submitted voluminous documents purporting to be a complete response to the subpoena *duces tecum*. Further, Continental Oil Co. has purportedly submitted all the documents called for by the subpoena except for certain files called for by Specifications G and I which have been termed "bid files." These "bid files" will be the subject of a subpoena enforcement action. The completeness of the respective submissions of these companies cannot be vouchsafed until they have been completely reviewed and knowledgeable officials of the companies are questioned at future hearings; and

4. The American Gas Association has made available for examination by the Commission's staff certain field by field estimates for Offshore Southern Louisiana. This data reveals that some 200 such fields were reported on.

DONALD K. TENNEY.

Subscribed and sworn to before me this 7th day of March, 1973.

JUANITA A. WELLS,
Notary Public.

My commission expires March 15, 1977.

EXHIBIT 7, ATTACHMENT A

Before the Federal Trade Commission

Title No. 7110042

IN THE MATTER OF AMERICAN GAS ASSOCIATION, INC.

WASHINGTON, D.C., *August 5, 1971.*

Deposition of R. B. GIBBS, taken pursuant to notice, at 10:00 a.m.

Before: DONALD K. TENNEY, *Bureau of Competition.*

Appearances: ANTHONY J. DE PHILLIPS, JAMES R. HERMSEN, *Counsel for the Federal Trade Commission.* D. LAMAR SMITH, Esq., *Counsel for R. B. GIBBS.* FREDERICK M. ROWE, Esq., *Counsel for American Gas Association, Inc.*

A. Now?

Q. Yes.

A. I am Chairman of the South Louisiana SubCommittee of the American Gas Association.

Q. How long have you been Chairman?

A. Approximately twelve years.

Q. And what are your duties as Chairman of that SubCommittee?

A. Well, I am responsible to Mr. Jacobs, who is the present Chairman of the Committee, for timely and accurate reserve determinations on an annual basis from South Louisiana.

In order to do that I have the responsibility of putting together an organization which can get that job done.

Q. You appoint various Subcommittee members?

A. Yes, I generally discuss it with Mr. Jacobs.

Q. As to the appointment?

A. Yes. But I am the one who appoints members of the Subcommittee.

Q. Now, can you tell us a little bit about the background of how you were selected for the Subcommittee? That is your first entry into the Subcommittee and Committee that we are discussing?

A. When I was transferred back to Shreveport; I did my field work in South Louisiana, and I was transferred back to Shreveport in the early part of 1948.

Q. Who were you employed by at that time?

Are Subcommittee assignments made on the basis of fields?

A. Yes.

Q. Now, what criteria do you use in assigning a particular field to a particular Subcommittee member?

A. The criteria was whether or not—whether the man to whom we assign a field has the necessary information from which to make an estimate.

Obviously, if a new discovery is made by Texaco or Humble, the Texaco man or the Humble man would naturally know more about that, that particular field, than anyone else.

Q. All right. Now could I have Gibbs Exhibit I for a moment here?

Appropos to what you state, here we have Mr. Foss (indicating), who is with Chevron Oil Company. From that last statement may we surmise that the next two pages here relate to fields in which Chevron Oil has some interest?

A. Not absolutely. I mean, you could not take this list and add up the reserves that Chevron brought in and say that these are reserves owned by Chevron Oil Company.

Q. Well, as to "some interests" might it be a joint interest of some kind?

A. No. There might be occasions where they would have the off-site lease.

Q. They would be adjacent?

A. Yes. They might be adjacent to it without actually owning anything there. I don't think you can make the asumption that they have a proprietary interest in every one of those.

Q. Would it be a safe assumption that they have a proprietary interest in most of these?

A. Yes, I think so.

Q. And they are proximate to by location or adjacent to those fields listed here in which they have no intrest.

A. I didn't quite get your question.

Q. You have stated that most of the fields here listed on the first two pages of Exhibit I would represent fields in which Chevron Oil has a proprietary interest.

A. To some degree, yes.

Let me clarify that. They may not necessarily have the whole interest; I mean, they might only have two wells.

Q. I understand.

A. There might be twenty wells.

Q. But Chevron would have some interest?

A. Chevron would know more about it than anybody else on the Committee, in which case they would have had it.

Q. Because they have some proprietary interest in the field?

A. No, no. Not because they have some proprietary interest, but because they have the knowledge of the geology and the reservoir mechanics.

Q. Because of their proprietary interest?

Well, whatever the reason for assigning them, you have—you will indicate by yes or no, does Chevron Oil Company have some proprietary interest in most of the fields listed as being the responsibility of Mr. W. R. Voss?

A. I would say yes.

Q. And with respect to those in which it does not have a proprietary interest, would it be true that these fields are adjacent to fields in which Chevron Oil does have a proprietary interest?

A. I don't think that necessarily is true. It could be true.

Q. Adjacent or nearby. Would you accept that as a correction?

A. No, I wouldn't.

Q. There will be occasions——

A. There will be occasions. I wouldn't want you to draw the conclusion that this is true in all cases. There could be a case where that is not true.

Q. Now, what you stated about Chevron, would this also be true with respect to the fields assigned to Mr. ———, of Humble oil? Would most of those fields be fields in which Humble Oil and Refining Company has some proprietary interests?

A. I think that would be right to say.

Q. Can we say the same thing about Harold Meaker and Texaco?

A. Yes.

Q. And Cullen LaBlanc and Gulf Oil?

A. Yes.

Q. J. D. Clark and Union Oil?

A. Yes.

Q. John Kerr of Continental Oil Company?

Would most of these on the two pages following his name—would most of these fields be fields in which the Continental Oil Company has some proprietary interest?

A. I am less certain of that statement in regard to Mr. Kerr than the rest, because I am not as familiar with the offshore areas as I am perhaps with the others.

And I don't know—the offshore area is very complex and there are many combines operating, and it is a little bit more complex and complicated than onshore, but the reason why these fields were assigned to Mr. Kerr is that he has more information on those fields than anybody else on the Subcommittee would have.

And that is true of all the rest of them, of course.

Q. Yes?

A. But I can't be too sure about Mr. Kerr, because I am not so sure about the ownership of the various fields.

Q. I see. So most of—is it your belief that many of these are owned by Continental Oil—not completely, I am sorry—I shouldn't say "owned," but that Continental Oil Company has a proprietary interest?

A. They have some just in that area.

Q. Now let's for the moment skip you and just finish off this list. I don't know how many more there are here.

Mr. Swingle and Shell Oil Company.

A. I would say yes.

Q. That Shell has a proprietary interest in most of these fields listed after his name?

A. To some degree.

Q. Some degree of interest?

A. Yes.

Q. Allen Guiberteau and Pan American Petroleum Corporation, would the same thing be true of him as you have stated, for instance, of Mr. Voss?

A. Yes.

Q. Okay. Let's get back to these.

About how many fields are you responsible for?

A. Approximately 300.

Q. That's fine.

A. It could be plus or minus 100.

Q. Now, your company, I understand, has contracts in your own language, what the notation "AGA" in the right-hand corner of some of these sheets indicates?

A. The notation AGA means that this estimate is by us for AGA.

Q. By "us"?

A. The United Gas Pipeline.

Q. So you are stating that there is no distinction whether "AGA" is noted in the right-hand corner or whether "Co." is noted?

A. No. The distinction "AGA" in the right-hand corner means that it was made by us solely for the reason of putting it in because of our responsibility to AGA.

The company estimate means that we derived the data on here from our company estimate.

The "AGA" means we would not have estimated the reserves in that field, if we were not responsible for it to AGA.

Q. Would it indicate then that you or Mr. MacKenzie had gone out and looked at the raw data, whatever it was that was available, and you had worked up your own estimates on those?

A. That is right.

Q. Let's hop along—or hobble along, to another area here.

What is the Form 15 and with whom is it filed?

A. A Form 15 is an annual report of gas supplies filed with the Federal Power Commission for the year that is indicated on the form. They are filed annually with the Federal Power Commission.

Q. Now, you have brought with you some Form 15s, I notice, apparently for a five-year period; is that correct?

A. That is right.

Q. Why don't we begin with the most remote year, and work forward, number these as Physical Exhibits 35 et seq—34, et seq?

We have them for 1966, do we not?

A. That is right.

Mr. Tenney. Right. So let's call that Gibbs Physical Exhibit 34, and by my calculations, that would take us up, by 1970, so that we would be to Gibbs Physical Exhibit 38.

(The documents referred to were marked for identification as Gibbs Physical Exhibits 34 through 38, inclusive.)

By Mr. Tenney:

Q. As these are each being numbered, Mr. Gibbs, are there certain fields which you are responsible for the AGA, whose reserves are dedicated in their entirety to your company?

A. Yes.

Q. In these instances, would there be any difference then between proved reserves and dedicated reserves?

A. You are speaking of the dedicated reserves in the Form 15?

Q. Yes.

A. As compared to the proved reserves in AGA?

Q. That is correct. Were all those reserves in that field not dedicated to you?

A. There could be a difference. The reserves in the Form 15 are prepared for us by an independent consulting firm of Ryder-Scott Company, who are a consulting firm of geologists and engineers.

Our company policy is that any reserves which will be submitted to a regulatory body, we have an independent consultant to do this work for us.

Q. All right. A different party would be working that up with respect to those fields, but would the criteria for dedicated reserves in these instances be any different from the criteria for proved reserves?

A. In our situation, no.

Q. Let me just quickly ask you—we now have these numbered, and I think we are starting with 34—Gibbs Physical Exhibit 34 is the 1966 Form 15 filed by your company.

Gibbs Physical Exhibit 35 for 1967, 36 for '68, 37 for 1969, and 38 for 1970. Would you agree to that? Do you want to take a look?

Mr. Rowe. Can we say "producing companies"? Because that is the terminology which we have been living with.

Mr. Tenney. Well, it might confuse a producer company which is principally a gas company and pipeline company with one which is principally an oil-gas company.

Mr. Rowe. Well, I think you can bring that in in your interrogation of the witness, but what the nature of the business is which employes members of the Southern Louisiana Association——

Mr. Tenney. Actually, all I want to know is the source of the estimates by other Subcommittee members.

The Witness. Well, as I said, I don't know the source.

By Mr. Tenney.

Q. All right. What happens at these meetings in late February? You say that you come to the meetings with your worksheets already filled out, and they do the same?

A. Yes.

Q. When they come do they bring, or do you bring, any supporting data?

A. No.

Q. You mean the only thing that anyone has to look at at these meetings are the worksheets themselves?

A. That is correct.

Q. All right. Now, when the meetings take place, as you have already indicated, each member is given a copy of each member's worksheets. Is this done precisely at that time?

A. These things are discussed; if there are any changes to be made, they are made at that time and then we—I mean MacKenzie and myself, take these sheets from everybody, back to Shreveport, and we reproduce them for everybody, so that each member has a copy.

Q. Mr. Gibbs, would you just go over that again, exactly the timing sequence here, as to when members obtain worksheet copies from other Subcommittee members?

A. This is after the Subcommittee meeting.

Q. All right. But during the Subcommittee meeting, does each Subcommittee member have access to the worksheets brought by other members?

A. Yes.

Q. But there is no access to the underlying data at this time, because they don't bring it with them. Is that correct?

A. That is right.

Q. All right. Now, what check, if any, is there of a given Subcommittee member's work by other Subcommittee members?

A. Well, as I said, this is no—I can't go to another company office and look over somebody's shoulder while he is making his estimate. But those people on the Subcommittee, the Subcommittee members, are pretty knowledgeable people.

They are mature, competent engineers and geologists, experienced men, who have been estimating reserves for some time, and because of the fact that in some companies there is diverse ownership in some of these fields, one of our—well, there might be three Subcommittee member who will have data on a particular field, but one Subcommittee member brings it, so the other two certainly know what the estimate is, or have made some kind of a study.

Likewise, we look at many fields in South Louisiana for which we do not bring in estimates.

Q. How is this done? Oh, you are talking about because of the company——

A. Yes. We don't police these fellows, and try to look over their shoulder, but we feel that if anybody was way out of line, he would be checked.

Q. Has this happened?

A. It has happened, but very infrequently.

Q. Very infrequently that a Subcommittee member's estimate are off?

A. Yes.

Q. How would you know that it is out of line if you don't have the background data with you?

A. Well, you might have a difference of opinion, at which time you go into discussion on it.

Q. Well, we are talking about hundreds and hundreds of fields, and someone comes in with a list of fifty or sixty fields, and with his estimates on these—that is what these worksheets indicate—how would you know whether these estimates are out of line?

A. Well, you wouldn't know if every one of them was out of line, but you might see one or two there that you would have some knowledge of, in which case you would.

I am not saying that I know, whether I am able to tell whether any field that you might pick out is out of line, but there are some I would know.

Q. What happens if there is disagreement among Subcommittee members as to what the estimate for a given field should be?

A. We would discuss the situation and resolve it right there.

Q. Can you tell me whether there were any such discussions or resolutions during the years involving estimates for '68 and '69?

A. I don't recall any.

Q. You don't recall any?

A. No, sir.

Q. As far as you know, the worksheets that were presented in the Subcommittee meetings in late February for the calendar years '68 and '69 were adopted without debate?

Q. Now, I get the impression, reading this, that the Subcommittee Chairman get access to all the underlying data. I have the impression here today, from hearing you, Mr. Gibbs, state that you do not have access to the data underlying the worksheets of other subcommitteemen—

Mr. Rowe. Well, I object to that form of question, Mr. Tenney. I have no objection to your asking Mr. Gibbs the question, but I resent——

By Mr. Tenney:

Q. The question is: do you have access to the underlying documents going into these worksheets of other Subcommittee members?

A. I have never exercised the prerogative to have access. Let me say that I have worked with most of these people for many years.

They are as competent professional men as you can find anywhere in the country. I believe in what they do. I am convinced they write the best numbers they know how to write; if I were not so convinced, I would ask them to no longer be members of the Subcommittee.

In my judgment they have been discharging their responsibilities to the Subcommittee to the best of their abilities, and I have no reason to quarrel with their estimates.

Q. I wonder if you would comment on SC Exhibit 86.

EXHIBIT 7, ATTACHMENT B

Federal Power Commission Docket No. AR 69–1. Area Rate Proceedings (Southern Louisiana) Prepared Testimony of John C. Jacobs, Jr.

Q. Please state your name and address.

A. My name is John C. Jacobs, Jr. My business address is Texas Eastern Transmission Corporation, P.O. Box, Houston, Texas.

Q. Mr. Jacobs, by whom are you employed and what is your present position?

A. I am employed by Texas Eastern Transmission Corporation and I am Senior Vice President.

Q. Are you also Chairman of the American Gas Association Committee on Natural Gas Reserves?

A. Yes.

Q. Have you been asked to testify in this proceeding by the UDC Group and to answer certain questions propounded by Mr. R. G. Groch, General Counsel to the Federal Power Commission, in a letter dated March 16, 1970, and served on all the parties?

A. Yes, sir. In view of the apparent widespread desire that the methods of operating of the ACA Committee on Natural Gas Reserves be fully developed in the AR69–1 proceeding, I am happy to appear as a witness for the UDC Group.

Q. Please describe your educational background and experience?

A. Educationally, I received a Bachelor of Science in Chemical Engineering degree from Georgia Institute of Technology in 1939 and a Bachelor of Laws degree from Yale University in 1948.

Professionally and on the legal side, I am a member of the American Bar Association, and am licensed to practice in the courts of Texas and Federal District Courts, Circuit Courts and the U.S. Supreme Court.

On the engineering side, I am a registered professional engineer in Texas, a member of Colegic ie Ingenieros de Venezuela, a member of the Institute of Petroleum and the Institution of Gas Engineers in England, and hold memberships in the following U.S. societies: Society of Petroleum Engineers of the American Institute of Mining and Metallurgy Engineers, American Institute of Chemical Engineers, and the American Petroleum Institute.

As to the gas industry, I was a founder of the Wilcox Trend Gathering System in Texas and served as Executive Vice President from 1952 through 1955. From 1955 through 1966, I served as Vice President of Texas Eastern Transmission Corporation where my principal duties were concerned with gas supply. Since 1966 I have served as Senior Vice President of that organization as head of its Petroleum Division. I have been a member of the American Gas Association since 1965.

I have been associated with the estimation of reserves in one way or another since my initiation into this fraternity as a reservoir engineer of Creole Petroleum Corporation in Caracas, Venezuela, in 1944.

Q. Please briefly describe the American Gas Association.

A. The American Gas Association is one of the oldest industrial associations in the United States. It has among its members some 345 distribution companies located in every State of the Union, and supplying gas service in every major town and city of the country, except certain cities in Northern New England.

The distribution companies which are members of the American Gas Association comprise some of the oldest utility operations in the United States. The earliest company has operated since 1916. Gas has been served by quite a few member companies from the middle 1900's.

Also included in the membership of the Association are most of the long-distance interstate transmission companies which carry gas from the producing fields to the distribution companies.

The American Gas Association was organized to assist the member companies in research, coordination of industry activities, and in the collection, coordination and dissemination of ideas and information. The AGA is recognized as one of the principal sources of authoritative statistical data on the gas industry in the United States.

Q. Please state the number of members in the AGA and, in answer to Question No. 1 in Mr. Cooch's letter, give the breakdown between distributors, pipelines, producers and others.

A. Information supplied to me by the headquarters staff of the American Gas Association on April 15, 1970, indicates that the AGA has 389 voting members made up of 345 domestic distribution companies, 13 foreign distribution companies and 31 domestic pipeline companies. The AGA also has 5,400 individual members. In addition, there are 683 non-voting associate members. The associates are made up of 606 manufacturing companies, 55 consulting organizations, 17 producing companies and 5 financial organizations.

Q. When and why was the AGA Committee on Natural Gas Reserves established?

A. It was established in 1945 to provide the industry, the Government and the general public an annual estimate of the proved natural gas and natural gas liquids reserves of the United States.

* * * * * * *

Q. What are your duties as Chairman of the Reserves Committee?

A. My duties are to select, from the men, excellent candidates available, the best for Committee membership, to appoint the members of the Committee, to coordinate the activities of the Committee and to supervise the preparation of the Report.

Q. Will you please describe the organizational structure of the Committee.

A. The nation is divided into 10 geographical districts, each of which is under the jurisdiction of a member of the Committee. The reserves for each of these districts are determined by a Subcommittee comprised of the Committee member and a Subcommittee which he, in turn, appoints and supervises. The reserves so determined for the several districts are then added together to get the reserves for the nation as a whole.

* * * * * * *

Q. Mr. Gooch's Question No. 4 is as follows: "Are there any other persons, such as observers, who participate either officially or unofficially in the work of the Committee or any Subcommittee?"

A. Meetings of the Committee and Subcommittees are attended only by the Committee and Subcommittee members, it being the position of the Committee that only these actual members can make a contribution to the work being done.

Q. How and when are Subcommittee meetings scheduled?

A. Subcommittee meetings are scheduled by the Subcommittee Chairman as and when he deems best to provide coordination of the work and timely reporting of the reserves and productive capacity determination.

Q. Do you have knowledge of the figures for individual fields as determined by the Subcommittee?

A. No. The Subcommittee Chairmen report to me only the total figure for their respective areas.

Exhibit 7, Attachment C

Organization, Procedures, and Definitions

INTRODUCTION

The American Gas Association is recognized as one of the principal sources of authoritative statistical data on the gas industry of the United States. As part of the Association's overall program, the Committee on Natural Gas Reserves were established to provide the industry, the government and the general public an annual estimate of the gas and natural gas liquids reserves of the United States within established regions and to supply other pertinent statistics in the field of gas and natural gas liquids reserves, production and productive capacity as required. The Committee on Natural Gas Reserves derives its authority from, and is responsible to, the Board of Directors of the Association.

It is the established policy of the Committee to restrict its coverage of industry statistics to current and historical data and not to participate in the determination and publication of forecasts of supply and demand or of estmiates of natural gas and natural gas liquids reserves that are speculative in nature.

The Committee adheres firmly to the policy of maintaining in the strictest confidence the basic data and reserve estimates for individual fields and reservoirs on which published totals by states and subdivisions of states are based. As the continued existence of the Committee and the value of its esimates depend upon the availability of confidential interpretations of data obtained from many individual and company sources it is obligatory that every member of the Committee and each Subcommittee respect the confidential nature of the individual reservoir or field reserve data and report any violation of this policy. It is recognized that the majority of the basic data used in reserve determinations is available from records of regulatory bodies, industry reports and commercial sources for the cost of obtaining and compiling the data in a usable form. The compiled information as well as the individual interpretations of these data is regarded as confidential. It should be noted that certain terms and definitions contained in the report have been formulated by the Committee solely for the purpose of making the report clear and understandable and they should not be construed as necessarily being in conflict with or having a different meaning than any other accepted technical statement of terms and definitions relating to the same subject.

ORGANIZATION

The Chairman of the Reserves Committee is appointed by the President on behalf of the Board of Directors of the Association. The Secretary of the Committee is from the Dept. of Statistics of the Association and is a member of the Reserves Committee. A representative from the United States Bureau of Mines in an ex officio member of the Committee. Other Committee members are appointed by the Chairman and assigned geographic areas of responsibility. In carrying out this responsibility each Committee member maintains a organization of an Area Subcommittee composed of qualified technical personnel from industry who under his supervision and in accordance with the procedures and guidelines formulated the Committee compile and report the necessary reserves, production and productive capacity data to the Committee member responsible for the Area for inclusion in the Annual Report of the Committee.

Membership on the Committee and each Subcommittee is retained by each individual so long as the assignments are properly discharged and the policies of the Committee are observed. Each individual is expected to serve only as long as he retains an affiliation with the oil and gas industry in an active capacity which enables him to make a contribution to the work of the Committee or Subcommittee.

The geographic districts of the United States assigned to Reserve Committee members and their Subcommittee organizations are as follows:

1. *Appalachian Area:* Kentucky, Maryland, New York, Ohio, Pennsylvania, Tennessee, Virginia, and West Virginia.
2. *Southeast Area:* Alabama, Florida, and Mississippi.
3. *South Central Area:* Arkansas and North Louisiana.
4. *South Louisiana Area:* South Louisiana including the Offshore Area.
5. *Texas Gulf Coast Area:* Texas Railroad Commission Districts 1, 2, 3, and 4 including the Offshore Area.
6. *Northeast Texas Area:* Texas Railroad Commission Districts 5, 6, 7B, and 9.
7. *West Texas-Southeast New Mexico Area:* Texas Railroad Commission Districts 7C, 8, 8A, and Southeast New Mexico.
8. *Mid-Continent Area:* Illinois, Indiana, Iowa, Kansas, Oklahoma, Michigan, Missouri, and Texas Railroad Commission District #10.
9. *Rocky Mountain Area:* Colorado, Montana, Utah, Wyoming, Northwest New Mexico, Nebraska, and North Dakota.
10. *Pacific Coast Area:* Alaska, Arizona, Oregon, Washington, and California, subdivided into San Joaquin Valley Region including the Sacramento Valley Area, the Coastal Region, and the Los Angeles Basin Region.

Subcommittees

Each Committee member is the Subcommittee Chairman for the respective areas of his responsibility. The Subcommittees, which are responsible for the determination of reserves, are composed of geologists and engineers from all segments of the oil and gas industry. They are experienced in reserve determination and/or producing capacity estimation and have intimate knowledge of the areas assigned to them. They also have available to them in company records detailed information of industry operations and developments.

Coordination with A.P.I. Committee on Reserves and Productive Capacity

The A.G.A. and A.P.I. Reserves Committee have joint responsibilities in the determination of certain reserves and production. Original recoverable dissolved gas reserves, dissolved gas production and remaining reserves are directly related to the original crude oil in-place in the reservoirs and oil well production as determined by the A.P.I. Subcommittees. The A.G.A. Committee on Natural Gas Reserves must for necessity report all gas and natural gas liquids statistics. Therefore, cooperation between the A.G.A. Subcommittee and the respective A.P.I. Area Subcommittee is required.

TABLE I.—ESTIMATED TOTAL PROVED RECOVERABLE RESERVES OF NATURAL GAS IN THE UNITED STATES

[Millions of cubic feet—14.73 lb/in²a, at 60° F.]

State	Reserves as of Dec. 31, 1968	Changes in reserves during 1969						Reserves as of Dec. 31, 1969			
		Extensions	Revisions	New field discoveries	New reservoir discoveries	Net change in underground storage [1]	Preliminary net production	Total gas	Non-associated	Associated-dissolved	Underground storage [2]
Alaska [3]	5, 252, 324	0	37, 155	0	0	0	87, 336	5, 202, 143	4, 882, 363	319, 780	0
Arkansas	2, 715, 065	103, 247	(83, 734)	32, 500	25, 789	5, 967	166, 061	2, 632, 773	2, 466, 209	129, 347	137, 217
California:	7, 316, 329	109, 615	58, 448	7, 885	40, 220	3, 219	664, 770	6, 870, 946	2, 857, 084	3, 826, 608	137, 254
San Joaquin Valley [4]	5, 461, 368	63, 615	14, 968	500	29, 800	1, 888	452, 315	5, 119, 824	2, 653, 071	2, 376, 008	90, 745
Coastal Region [4]	1, 019, 859	41, 500	29, 129	885	3, 850	(147)	108, 616	936, 460	191, 232	750, 831	44, 397
Los Angeles Basin [4]	835, 102	4, 500	14, 351	6, 500	6, 570	1, 478	103, 839	764, 662	12, 771	699, 769	52, 112
Colorado	1, 660, 103	10, 741	20, 561	11, 425	1, 744	423	108, 711	1, 596, 286	1, 454, 043	122, 932	19, 311
Illinois	297, 908	0	(1, 432)	0	0	44, 806	3, 470	337, 812	1, 070	16, 238	320, 504
Indiana	75, 458	0	764	0	0	2, 651	1, 312	77, 561	1, 646	5, 341	70, 574
Kansas	14, 511, 173	163, 225	324, 587	12, 022	853	(557)	886, 178	14, 185, 125	13, 671, 686	361, 631	91, 753
Kentucky	923, 289	41, 650	27, 000	1, 280	4, 750	1, 855	79, 304	920, 520	817, 257	53, 263	50, 000
Louisiana: [4]	88, 015, 624	1, 984, 153	1, 046, 473	262, 140	1, 002, 308	23, 505	7, 277, 564	85, 056, 639	69, 429, 161	15, 514, 268	113, 210
North	4, 622, 735	47, 831	(522)	1, 951	80, 096	23, 505	488, 394	4, 287, 202	2, 826, 606	1, 347, 386	113, 210
South	83, 392, 889	1, 936, 322	1, 046, 995	260, 189	922, 212	0	6, 789, 170	80, 769, 437	66, 602, 555	14, 166, 882	0
Michigan	757, 426	2, 238	21, 371	9, 130	0	(4, 733)	34, 468	750, 964	78, 268	82, 136	595, 510
Mississippi	1, 434, 078	34, 066	16, 943	73, 954	18, 285	(921)	165, 507	1, 410, 898	1, 124, 539	281, 022	5, 337
Montana	911, 533	167, 839	58, 244	877	10, 914	4, 816	43, 995	1, 110, 208	799, 770	147, 927	162, 511
Nebraska	56, 768	24	5, 661	121	0	1, 298	7, 278	56, 594	26, 934	13, 204	16, 456
New Mexico:	15, 143, 204	291, 506	(108, 723)	25, 289	21, 965	(4, 063)	1, 087, 675	14, 281, 503	11, 147, 421	3, 124, 813	9, 264
Northwest	9, 554, 360	105, 058	(32, 315)	0	560	0	553, 098	9, 074, 565	8, 988, 925	85, 640	0
Southwest	5, 588, 844	186, 448	(76, 408)	25, 289	21, 405	(4, 063)	534, 577	5, 206, 938	2, 158, 496	3, 089, 178	9, 264
New York	124, 087	2, 600	(3, 270)	400	0	1, 584	4, 861	120, 540	22, 371	151	98, 018
North Dakota	866, 810	7, 150	(183, 211)	1, 877	0	0	44, 062	648, 564	5, 737	642, 827	0
Ohio	783, 875	73, 000	(2, 500)	22, 100	0	(15, 739)	51, 443	809, 293	280, 348	112, 081	416, 914
Oklaho na	18, 363, 265	866, 796	(260, 940)	196, 125	86, 475	16, 130	1, 679, 654	17, 593, 197	13, 870, 792	3, 515, 459	206, 946
Pennsylvania	1, 344, 996	64, 000	(43, 000)	4, 000	1, 000	12, 045	79, 134	1, 303, 907	791, 804	13, 534	498, 569

TABLE I.—ESTIMATED TOTAL PROVED RECOVERABLE RESERVES OF NATURAL GAS IN THE UNITED STATES—Continued

[Millions of cubic feet—14.73 lb/in²a, at 60° F.]

State	Reserves as of Dec. 31, 1968	Changes in reserves during 1969						Reserves as of Dec. 31, 1969			
		Extensions	Revisions	New field discoveries	New reservoir discoveries	Net change in underground storage [1]	Preliminary net production	Total gas	Non-associated	Associated-dissolved	Underground storage
Texas:											
Recoverable Reserves											
Committees:											
District No. 1 [4]	119,001,196	1,311,513	(2,113,311)	1,033,730	811,331	3,706	7,653,970	112,392,622	82,060,656	30,237,370	94,596
District No. 1 [4]	2,215,914	0	10,537	2,735	3,033	(5)	135,113	2,127,201	1,857,735	263,965	431
District No. 2 [4]	10,771,613	0	91,621	71,625	153,055	611	657,165	10,445,403	8,034,911	2,403,393	2,036
District No. 3 [4]	25,529,432	73,539	(333,305)	209,031	177,335	2,099	1,591,035	23,751,937	17,532,525	6,207,451	12,009
District No. 4 [4]	32,370,315	122,414	(230,193)	185,235	312,622	0	1,575,734	31,215,625	23,365,785	7,849,840	0
District No. 5	1,347,637	6	(115,015)	267,211	43,972	472	120,736	1,428,567	1,212,935	183,503	31,979
District No. 6	6,339,422	8,573	57,621	22,673	6,101	0	487,195	5,997,201	3,759,139	2,238,062	0
District No. 7-B	774,066	32,122	70,934	3,020	238	550	94,733	785,257	275,110	476,837	24,310
District No. 7-C	3,917,013	121,190	(83,905)	6,128	15,322	203	209,645	3,765,150	2,602,739	1,161,314	2,047
District No. 8	18,438,065	603,720	(776,931)	227,353	54,399	0	1,329,267	17,217,339	11,696,153	5,521,186	0
District No. 8-A	3,245,675	6,276	(49,114)	746	561	0	202,959	3,001,185	110,607	2,890,578	0
District No. 9	2,243,361	38,552	(189,486)	13,630	260	219	181,395	1,925,141	1,493,469	419,939	11,733
District No. 10	11,775,452	395,191	(265,953)	29,235	7,872	(381)	1,129,850	10,780,556	10,119,354	611,212	0
Utah	1,156,556	19,613	(32,859)	114	0	213	52,874	1,090,768	644,180	415,276	1,312
Virginia	34,341	0	0	0	0	0	2,903	31,488	31,433	0	0
West Virginia	2,535,581	178,716	(125,000)	16,840	14,035	(9,239)	213,009	2,417,324	2,050,917	53,044	338,363
Wyoming	3,578,535	323,651	102,582	57,517	---------	3,125	318,305	3,937,045	3,295,851	593,089	42,105
Miscellaneous [5]	245,418	45,141	(17)	201	0	17,078	3,656	304,165	66,737	11,248	226,180
Total United States	237,349,852	5,800,489	(1,238,261)	1,769,557	2,043,219	107,169	20,723,190	275,103,835	211,873,282	59,633,641	3,601,909

Note.—Figures in parentheses denote negative volumes.

[1] The net difference between gas stored in and gas withdrawn from underground storage reservoirs, inclusive of adjustments and native gas transferred from other reserve categories.

[2] Gas held in underground reservoirs (including native and net injected gas) for storage purposes.

[3] Reserve on certain portions of the North Slope of Alaska are not included because the AGA Reserves Committee did not have sufficient data upon which it could base an estimate of proven reserves for this Area as of Dec. 31, 1969

[4] Includes off-shore reserves. Total remaining recoverable natural gas reserves in the Gulf of Mexico are estimated to be 35,306,705 million ft³ of which 30,349,309 million ft³ are nonassociated, and 4,957,396 MM ft³ are associated dissolved. As of this date the ultimate natural gas reserves in the Gulf of Mexico are estimated to be 48,607,745 million ft³ of which 40,921,160 million ft³ are nonassociated, and 7,686,585 MM ft³ are associated dissolved.

[5] Includes Alabama, Arizona, Florida, Iowa, Maryland, Minnesota, Missouri, South Dakota, Tennessee, and Washington.

EXHIBIT 7, ATTACHMENT D

DEC. 28, 1970.

Re: American Gas Association, File No. 711 0042.

Mr. JOHN C. JACOBS, Jr.,
Chairman, Committee on Natural Gas Reserves,
American Gas Association, Inc.
Arlington, Va.

DEAR MR. JACOBS: This Bureau is presently conducting an investigation into the reporting of natural gas reserves by the American Gas Association. In that regard, we have prepared an informal questionnaire, incorporated herein, requesting certain documents of the American Gas Association's Committee on Natural Gas Reserves and its Southern Louisiana Area Subcommittee which relate to gas reserves in that Subcommittee's area. As Chairman Kirkpatrick of the Commission indicated to you in his letter of October 23, 1970, we appreciate your offer to assist us in this investigation.

For purposes of this questionnaire, the following definitions shall be applicable:

1. "Proved reserves," "discoveries," "extensions," "revisions," "net production," and other terms used herein, as defined by the American Gas Association in *Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas in the United States and Canada and United States Productive Capacity as of December 31, 1969*, Volume 24, May 1970: specifically pages 85–118 therein, and *Standard Definitions for Petroleum Statistics*, American Petroleum Institute, Technical Report No. 1, July 1, 1969.

(*a*) Obtain the total number of all such tests and holes

(*b*) Obtain information showing the presence or absence of gas accumulations in such tests and holes

(*c*) Obtain data, where gas accumulations were present in said tests and holes, for determination as to whether the gas accumulations found should be included or excluded in estimates of proved reserves.

* * * * * * *

27. The methods and sources which are utilized by the AGA Committee, the Area Subcommittee and its members to:

(*a*) Determine the validity or invalidity of proved reserve estimates prepared by producers and operators, and

(*b*) Prepare reserve estimates where producers and operators refuse to provide relevant information and data or where the AGA Committee, the Area Subcommittee or its members consider information and data submitted by producers and operators to be inadequate, incomplete, or inaccurate.

28. Identify the producers, owners, or lessees of each field containing natural gas reserves in the Southern Louisiana area as of December 31, 1969.

29. Please submit copies of the minutes of the meetings, formal and informal, of the Committee on Natural Gas Reserves and the Southern Louisiana Area Subcommittee from January 1, 1965 through December 31, 1970.

30. List each individual member of the Committee on Natural Gas Reserves of the AGA (a) as of December 31, 1969, and (b) from January 1, 1960 to December 31, 1969, indicating for both (a) and (b):

(*a*) Name;
(*b*) Address;
(*c*) Occupation and employer;
(*d*) Length of time served, and
(*e*) Specific duties and responsibilities on Committee.

* * * * * * *

NATURAL GAS RESERVES COMMITTEE MEMBER AS OF DECEMBER 31, 1969

Ed Parkes (Chairman, 1960–69), chairman of Executive Committee, Pennzoil United, Inc., Box 1407, Shreveport, La.

J. C. Jacobs (Vice Chairman, 1969), senior vice president, Texas Eastern Transmission Corp., P.O. Box 2521, Houston, Tex.

D. S. Colby (Alternate, 1951–57; 1958–69), Division of Economic Analysis, Bureau of Mines, Washington, D.C.

P. A. Cole (Subcommittee, 1948; Chairman—District No. 2 and Texas RR Commission District 10, 1962–69), chief geologist, Cities Service Gas Co., P.O. Box 25128, Oklahoma City, Okla.

R. O. Garrett (Chairman—Arkansas & North Louisiana, 1960–69), president, Texas Gas Exploration Corp., P.O. Box 52310, Houston, Tex.

B. B. Gibbs (Subcommittee, 1948–52; Chairman—South Louisiana, 1953–69), Manager, Gas Availability Department, United Gas Pipe Line Co., Box 1407, Shreveport, La.

J. V. Goodman (Chairman—Appalachian States, 1960–69), vice president and chief geologist, Equitable Gas Co., 420 Boulevard of the Allies, Pittsburgh, Pa.

J. R. Jordan (Chairman—Texas RR Commission Districts 5, 6, 7–B, 9, 1966–69), manager, gas reservoir engineering section, Gas Supply Department, Lone Star Gas Co., 301 South Harwood St., Dallas, Tex.

J. N. Newmyer (Chairman—New Mexico, Texas RR Commission Districts 7–C, 8, 8A, 1965–69), district reservoir engineer, Gulf Oil Corp., P.O. Box 1150, Midland, Tex.

E. D. Pressler (Chairman—Texas RR Commission Districts 1, 2, 3, 4, 1960–69), reserve coordinator—production department headquarters, Humble Oil & Refining Co., Box 2180, Houston, Tex.

D. R. Scherer (Chairman—Mississippi, Alabama, Florida, 1960–69), exploitation geologist, Southern Natural Gas Co., P.O. Box 1513, Houston, Tex.

A. H. Wieder (Chairman—Rocky Mt. Region, 1960–69), staff exploitation engineer, Shell Oil Co., 1700 Broadway, Denver, Colo.

M. T. Whitaker (Chairman—Pacific Coast and Alaska, Arizona, Nevada, 1960–69), regional planning analyst, Mobil Oil Corp., P.O. Box 2122, Terminal Annex, Los Angeles, Calif.

T. I. Gradin (Secretary, 1960–69), manager, department of statistics, American Gas Association, Inc., 605 Third Ave., New York, N.Y. (Present address for A.G.A.: 1515 Wilson Blvd.

Ed Parkes (Chairman, 1960–69), chairman of executive committee, Pennzoil United, Inc., Box 1407, Shreveport, La.

W. F. Burke (Chairman—Texas RR Commission Districts 5, 6, 7–B, 9, 1960–66), Lone Star Gas Co., 301 South Harwood St., Dallas, Tex.

D. S. Colby (Alternate, 1951–57; Member, 1958–69), division of economic analysis, Bureau of Mines, Washington, D.C.

P. A. Cole (Subcommittee, 1948–61; District No. 2 and Texas RR Commission District 10, 1965–69; District No. 2, 1962–64), chief geologist, Cities Service Gas Co., P.O. Box 25128, Oklahoma City, Okla.

R. O. Garrett (Chairman—Arkansas & North Louisiana, 1960–69), president, Texas Gas Exploration Corp., P.O. Box 52310, Houston, Tex.

B. B. Gibbs (Subcommittee, 1948–52; Chairman—South Louisiana, 1953–69), manager, gas availability department, United Gas Pipe Line Co., Box 1407, Shreveport, La.

J. V. Goodman (Chairman—Appalachian States, 1960–69), vice president & chief geologist, Equitable Gas Co., 420 Boulevard of the Allies, Pittsburgh, Pa.

J. C. Jacobs (Vice Chairman, 1969), senior vice president, Texas Eastern Transmission Corp., P.O. Box 2521, Houston Tex.

J. R. Jordan (Chairman—Texas RR Comimssion Districts, 1966–69), manager gas reservoir engineer section, gas supply department, Lone Star Gas Co., 301 South Harwood St., Dallas, Tex.

J. N. Newmyer (Subcommittee, 1961–64, Chairman—New Mexico, Texas RR Commission Districts 7–C, 8, 8A, 1965–69), district reservoir engineer, Gulf Oil Corp., P.O. Box 1150, Midland, Tex.

E. D. Pressler (Chairman—Texas RR Commission Districts 1, 2, 3, 4, 1960–69), reserve coordinator production department headquarters, Humble Oil & Refining Co., Box 2180, Houston, Tex.

D. R. Scherer (Chairman—Mississippi, Alabama, Florida, 1957–69), exploitation geologist, Southern Natural Gas Co., P.O. Box 1513, Houston, Tex.

C. E. Turner (Chairman—New Mexico, Texas RR Commission Districts 7–C, 8, 10, 1960–64), Phillips Petroleum Co., Bartlesville, Okla.

A. H. Wieder (Subcommittee, 1951–58, Chairman—Rockey Mt. Region, 1959–1969), staff exploitation engineer, Shell Oil Co., 1700 Broadway, Denver, Colo.

M. T. Whitaker (Subcommittee, 1947–57, Chairman—Pacific Coast and Alaska, Arizona, Nevada, 1958–69), regional planning analyst, Mobil Oil Corp., P.O. Box 2122, Terminal Annex, Los Angeles, Calif.

T. I. Gradin (Secretary, 1960–69), manager, department of statistics, American Gas Association, Inc., 605 Third Avenue, New York, N.Y.

EXHIBIT 7, ATTACHMENT E

FEDERAL POWER COMMISSION—ORDER REQUIRING REPORTING OF SPECIFIED RESERVES DATA AND PRESCRIBING PROCEDURE

Before Commissioners: John N. Nassikas, Chairman; Lawrence J. O'Connor, Jr., Carl E. Bagge, John A. Carver, Jr., and Albert B. Brooke, Jr.

Area Rate Proceeding (Southern Louisiana Area)

Docket No. AR69–1

(Issued March 17, 1970)

On January 28, 1970, Pan American Petroleum Corporation and a number of other producers filed herein a motion requesting the Commission to enter its order requiring the reporting of certain gas reserves information by producer respondents for use in this proceeding. No answers thereto have been filed by any party or intervener. The reserves data in question relate to the volumes of uncommitted proved reserves controlled by the producer respondents in the Southern Louisiana area as of year end 1968 and year end 1969, separately stating the Federal Domain and the remaining Southern Louisiana area. We noted in our order enlarging this proceeding, issued December 15, 1969, that information of this type would be required, and we will accordingly order the reporting of such information, subject to the terms and conditions hereinafter set forth.

THE COMMISSION FINDS

The public interest requires that the volumes of proved natural gas reserves held by producers in the Southern Louisiana area and not contracted to interstate pipelines be reported and made available in this proceeding in the form and manner hereinafter prescribed.

THE COMMISSION ORDERS

(*a*) The questionnaire attached hereto as Appendix A shall be completed by all large producer respondents. The questionnaire attached hereto as Appendix B shall be completed by all original AR69–1 producer respondents. The completed questionnaires shall be mailed to Arthur Young & Co., P.O. Box 1529, Tulsa, Oklahoma 74101 no later than May 1, 1970.

(*b*) Arthur Young & Co., shall furnish to the staff and to all parties to this proceeding a composite of the individual questionnaire responses as soon as may be possible and will return the individual responses to the respective companies.

(*c*) The individual producer respondents who make reports pursuant to this order shall make such reports (including any workpapers or other data underlying such reports) available in their offices to the Commission's Staff upon request of Staff counsel.

(*d*) Compliance with this order shall not constitute nor be construed as a waiver of any claim of privilege in any future case, by any producer respondent.

(*e*) The individual company responses to the attached questionnaires and any other information revealed by a Staff audit of the responses are to be treated as confidential information without public disclosure by Arthur Young & Co.

or Staff. The provisions of § 8(b) of the Natural Gas Act [15 U.S.C. 717g(b)] and 5 U.S.C. 552(b)(4) (Freedom of Information Act) shall control.

By the Commission.

GORDON M. GRANT, *Secretary.*

EXHIBIT 7, ATTACHMENT F

Federal Power Commission, Bureau of Natural Gas

DOCKET NO. AR69–1, ET AL.

(AREA RATE PROCEEDINGS, ET AL, SOUTH LOUISIANA AREA)

TESTIMONY OF LAWRENCE R. MANGEN

Question. Please state your name, by whom you are employed, and your position?

Answer. My name is Lawrence R. Mangen. I am employed by the Federal Power Commission in the Bureau of Natural Gas as a supervising natural gas engineer.

Question. Briefly outline your educational and professional background?

Answer. I received a B.S. degree in Engineering at the University of Minnesota in 1955 and a M.S. degree in Geology in 1957 at the University of Minnesota. Upon graduation I was employed by Shell Oil Company as a junior engineer, field engineer, workover engineer and production geologist. Since 1962 I have been employed with the FPC. I am currently Assistant Section Head, Gas Supply Section and I am also team leader of the National Supply Team of the Gas Supply Section of the Analysis and Procedures Division of the Bureau of Natural Gas.

Question. Are you a member of any professional societies?

Answer. I am a member of the society of Petroleum Engineers of AIME, a fellow of the American Association for the Advancement of Science, and a registered professional engineer.

Question. Have you previously testified in any hearings?

Answer. Yes, I have testified before the Texas Railroad Commission, primarily on productive acreage hearings, and before the Federal Power Commission in two prior area rate proceedings, Docket Nos. AR61–2, (South Louisiana Area) and AR67–1 (Other Southwest Area).

Question. What is the purpose of your testimony?

Answer. The purpose of my testimony is to describe and explain the procedures used by the Commission staff in auditing the uncommitted reserve figures reported by the producers in this proceeding.

The Commission by its order of March 17, 1970 required producers to report certain reserve data by separate questionnaires for the Onshore and Offshore Areas in Southern Louisiana. The data were to be reported as of year-end 1968 and year-end 1969. Volumes of reserevs available for sale and reserves held for fulfillment of warranty gas sales contract were to be reported for the Onshore Area. In addition to the reporting of volumes of warranty gas and gas available for sale in the Offshore Area, the Commission required the reporting of volumes of gas reserves committed to direct industrial contracts and the reserves held for company use and fuel or feedstock but not subject to specific contract arrangements. The completed questionnaires were forwarded by each responding producer to the Tulsa, Oklahoma office of Arthur Young & Co. Donald W. Auten, a certified public accountant with that firm, composited the data and presented it in this proceeding as Exhibit No. 27. That exhibit has been a public record since May 26, 1970.

Question. Were the volumes reported by each individual respondent made public?

Answer. No. Under the Commission order, the individual company responses were to be treated as confidential information without public disclosure. However, that order also provided that the individual reports and data underlying such reports should be made available to the Commission staff upon request.

Question. Was a request for such an audit made?

Answer. Yes, it was made and an audit was performed.

Question. How was the audit performed?

Answer. The first step in the audit was to review all the individual company filings in order to verify the totals of the volumes composited by Mr. Auten in Exhibit No. 27. In order to maintain confidentiality I was selected as the only person who would see these filings.

* * * * * * *

Question. After verifying the individual components of the Auten composite, did you proceed to audit the data underlying the uncommitted reserves volumes as submitted by each producer?

Answer. Yes. I arranged to have members of the staff visit each company that reported having any uncommitted reserves in Southern Louisiana.

Question. Did the staff review the underlying data for every reservoir comprising the reported uncommitted reserves in Southern Louisiana?

Answer. No. In addition to the time limitations placed upon the staff by the necessity to complete the audit and submit the results in this proceeding, I concluded that a representative sample of the reservoirs involved would serve as an adequate basis for auditing the reported data.

* * * * * * *

Question. In terms of Mcfs what volume of reported reserves were examined by the staff?

Answer. I can't answer that question on the basis it is confidential information.

Question. Well, would it be incorrect to add the figures on page six, the available-for-sale figures as of December 31, 1969, for the offshore and onshore regions, and to multiply that by thirty-three percent?

Answer. That would give you an approximation.

Question. And would you accept, subject to check, that that approximation is 858 million cubic feet?

Answer. I will accept that subject to check. It doesn't sound to be the right magnitude, however, from my recollection of the total number.

Question. I wonder why is that information confidential, since we have the available-for-sale figures and we know the percentage of reserves examined and reviewed by the staff team. Why is the Mcf figure——

Answer. I destroyed all my work papers because they contained confidential information, and this number was on these work papers which were destroyed.

Question. As I understand it, the questionnaires, the purpose of the questionnaires was for the companies to report uncommitted proved gas reserves. Is that correct?

Answer. That's correct.

Question. Now, did you have any procedure, did the staff have any procedure whereby it could check to determine whether or not companies had not reported uncommitted proved gas reserves?

Mr. REBMAN. Mr. Examiner, just still by way of clarification, whether counsel is asking anything different than the question that was posed by the witness' own counsel on page twelve, transcript 5202. It sounds pretty much like the same thing to me.

Mr. MILLER. No, this is different for this reason: As I understand the question on page twelve, that is directed only to companies who reported no uncommitted gas reserves. I am speaking of companies——

PRESIDING EXAMINER. Is there any way that you could check whether a company had reported all its uncommitted proved reserves?

THE WITNESS. The only way that we could have done it was to perform the same kind of audit that we performed for the companies that reported none.

PRESIDING EXAMINER. Well, did you do that?

THE WITNESS. No.

PRESIDING EXAMINER. Go ahead.

EXHIBIT 7, ATTACHMENT G

FEDERAL POWER COMMISSION—ORDER AUTHORIZING THE ESTABLISHMENT OF NATIONAL GAS SURVEY ADVISORY COMMITTEES AND PRESCRIBING PROCEDURES

Before Commissioners: John N. Nassikas, chairman; Lawrence J. O'Connor, Jr., John A. Carver, Jr., and Albert B. Brooke, Jr.

(Issued February 23, 1971)

The Federal Power Commission has determined that a National Gas Survey is necessary and appropriate to the purposes of the Natural Gas Act, 15 U.S.C. 717(a) *et seq.* As carried out, the Survey will serve the interests of all who are, and may be, dependent upon or affected by the use and further development of the Nation's natural gas resources. Within the areas to be studied, the Commission contemplates detailed analyses *inter alia* of factors of demand, supply and alternate fuel sources, facility expansion, economic and environmental considerations, inflation, inter-fuel competition, import-export relationships and policies, and regulatory considerations—Federal, state and local. Other matters will be studied as appropriate.

To accomplish the objectives of the Natural Gas Act, in providing for the ultimate consumer an adequate and reliable supply of natural gas at a reaosnable price and the Nation a vital energy resource base, the Commission will direct the conduct of the Survey through the members of the Commission and its staff.

To assist the actions of the Commissioners and Commission staff, the Commission will use various advisory committees which shall be conducted under the general direction of the Commission and in accordance with the provisions of Executive Order No. 11007, February 26, 1962 (27 F.R. 1875). Currently, the Commission contemplates these advisory committees will include a National Gas Survey Executive Advisory Committee, a General Technical Advisory Committee and a number of Regional Advisory Committees. Others may be established. All will be conducted pursuant to the general requirements as set forth in this order. The Commission contemplates the issuance of specific order or orders from time-to-time establishing each committee and denominating its membership and chairmanship.

The advice of all committees shall be limited to matters relating solely to the planning and carrying out of the National Gas Survey. The Commission will have complete responsibilty for the National Gas Survey with respect to its conduct, scope, the ultimate recommendations and the acceptance of the final report. In discharging these responsibilities, the Commission will approve the Survey's objectives, scope of work, organization and schedule of performance, make any required policy determinations and give its advice directed toward the coordination and cooperation between the Survey and any inter-governmental, state, industry, agency or representative, including any other expertise as required.

1. Purpose. The committees shall advise and make recommendations to the Commission in planning and carrying out the Commission's proposed National Gas Survey.

2. Selection of Committee Members. All committee members, alternates and persons designated to act as committee chairman shall be selected and designated by the Chairman of the Commission with the approval of the Commission.

3. Conduct of Meetings. The Chairman of the Commission, or in his absence, the Vice Chairman of the Commission, or any full-time salaried officer or employee of the Commission designated by the Chairman of the Commission, who shall act as chairman of a committee, shall be responsible for opening, conducting and adjourning committee meetings when, in his judgment, adjournment is in the public interest. When a committee is chaired by a person, designated by the Chairman of the Commission as chairman of that committee, who is not a full-time salaried officer or employee of the Commission, no meeting of such committee shall be held except at the call of, of with the advance approval of, a full-time salaried officer or employee of the Commission designated by the Chairman of the Commission, and with an agenda formulated or approved by such officer or employee; and all such meetings shall be conducted in the presence of such full-time salaried officer or employee of the Commission, who shall be responsible for opening the meeting, assisting in the conduct thereof, and for adjourning any meeting whenever he considers adjournment to be in the public interest.

4. Minutes. The Chairman of the Commission having made a finding that maintenance of a verbatum transcript would be impracticable and not in the public interest, there shall be kept by the secretary of each committee, in lieu thereof, a record of persons present, a description of matters discussed and conclusions reached, and copies of all reports received, issued, or approved by each committee.

5. Secretary of the Committee. The Chairman of the Commission shall appoint a secretary of each committee from among the members of the Commission staff who shall be responsible for preparing summary minutes of all committee meetings, preparing agenda, notifying members of the meetings, and maintaining all records related to organization, membership and operations of the committee. The secretary shall be present during all meetings and shall certify the accuracy of all minutes.

6. Location and Time of Meetings. Unless otherwise directed, committee meetings will convene at the call of the Chairman of the Commission at the Office of the Federal Power Commission, located at 441 G Street, N.W., Washington, D.C. 20426, or at such place and time as may be designated by the chairman of the committee with the approval of the Chairman of the Commission. Ordinarily, these meetings will be held during the regular working hours of the Federal Power Commission.

7. Advice and Recommendations Offered by the Committee. The advice and recommendations of the members of the committees may be presented to the Commission at committee meetings either orally or in written form. The advice of all committees shall be limited to matters relating solely to the planning and carrying out of the National Gas Survey and ultimate decisions based on the Committees' advice or recommendations are reserved to the Federal Power Commission.

8. Duration of the Committee. All committees shall terminate not later than two years subsequent to their date of establishment, unless the Commission determines in writing, not more than 60 days prior to the expiration of such two-year period, that continued existence of a committee is in the public interest. A like determination by the Commission shall be required not more than 60 days prior to the end of each subsequent two-year period to continue the existence of each committee thereafter.

The Secretary of the Commission shall cause prompt publication of this order to be made in the Federal Register in accordance with the provisions of the Office of Management and Budget Circular No. A–63.

By the Commission.

KENNETH F. PLUMB, *Acting Secretary.*

EXHIBIT 7, ATTACHMENT H

FEDERAL POWER COMMISSION—ORDER ESTABLISHING TECHNICAL ADVISORY AND COORDINATING COMMITTEE TASK FORCES AND DESIGNATING MEMBERSHIP

(Issued December 21, 1971)

Before Commissioners: John N. Nassikas, Chairman; John A. Carver, Jr., Albert B. Brook, Jr., Pinkney Walter, and Rush Moody, Jr.

The Federal Power Commission determines that the establishment of respective Task Forces to the Technical Advisory Committee—Supply, Technical Advisory Committee—Transmission, Technical Advisory Committee—Distribution and the Coordinating Committee, is in the public interest and establishes such Task Forces, as identified in the attached Appendix, all in accordance with the provisions of the Commission's orders issued February 23, 1971, 36 F.R. 3851, April 6, 1971, 36 F.R. 6922 and May 10, 1971, 36 F.R. 8910.

1. *Purpose.*—The purposes of the Technical Advisory Committee Task Forces are as set forth in the Commission's April 6, 1971, Order Establishing National Gas Survey Technical Advisory Committees and Designating Initial Membership, and the purposes of the National Gas Survey Coordinating Task Force are to further the discharge of the purposes as set forth in the Commission's May 10, 1971, Order Establishing National Gas Survey Coordinating Committee and Designating its Membership and Chairmanship. The Technical Advisory Committee Task Forces are organizationally subordinate to their respective Technical Advisory Committees, and the Coordinating Task Force is organizationally subordinate to the National Gas Survey Coordinating Committee.

The Commission's order issued February 23, 1971, states in part as follows:

"To assist the actions of the Commissioners and Commission staff, the Commission will use various advisory committees which shall be conducted under the general direction of the Commission and in accordance with the provisions of Executive Order No. 11007, February 26, 1962 (27 F.R. 1875). * * * All will be conducted pursuant to the general requirements as set forth in this order. The Commission contemplates the issuance of specific order or orders from time-to-time establishing each committee and denominating its membership and chairmanship.

"The advice of all committees shall be limited to matters relating solely to the planning and carrying out of the National Gas Survey. The Commission will have complete responsibility for the National Gas Survey with respect to its conduct, scope, the ultimate recommendations and the acceptance of the final report. In discharging these responsibilities, the Commission will approve the Survey's objectives, scope of work, organization and schedule of performance, make any required policy determinations and give its advice directed toward the coordination and cooperation between the Survey and any inter-governmental, state, industry, agency or representative, including any other expertise as required."

2. *Membership.*—With respect to each Task Force, the Task Force Chairman (who shall be designated Director), the Deputy Director, the FPC Survey Coordinating Representative and Secretary, the Alternate FPC Survey Coordinating Representative and Secretary, the FPC Representative and the other Task Force members, shall be selected by the Chairman of the Commission, with the approval of the Commission, and are designated in the Appendix hereto, and any additional persons that may be designated to serve on the Task Forces shall be selected by the Chairman of the Commission, with the approval of the Commission, provided, however, the Chairman of the Commission may select and designate additional persons to serve in the capacity of Alternate FPC Survey Coordinating Representative and Secretary. The person or persons who are designated as the FPC Survey Coordinating Representative and Secretary shall be full-time salaried officers or employees of the Commission. The FPC Survey Coordinating Representatives and Secretary, or alternates, shall be designated by the Chairman and serve as Secretary of the Task Force Committee for which selected. The Directors, Deputy Directors, FPC Survey Coordinating Representatives and Secretaries and alternates, the FPC Representatives and the other Task Force members, as selected and approved in accordance with this order, are designated in the Appendix hereto.

3. The following paragraphs of the aforementioned Commission order, issued February 23, 1971, are hereby incorporated by reference:

"3. Conduct of Meetings.

"4. Minutes.

"5. Secretary of the Committee.

"6. Location and Time of Meetings.

"7. Advice and Recommendations Offered by the Committee.

"8. Duration of the Committee."

4. In accordance with the provisions of Section 6(e) of Executive Order No. 11007, 27 F.R. 1875, none of the Task Forces herein established shall be permitted to receive, compile or discuss data or reports showing the past, current or projected non-public commercial operations of identified business enterprises. Data or reports of a non-public nature that are requested by the Federal Power Commission, its staff, National Gas Survey Advisory Committees and Task Forces from identified business enterprises shall be submitted directly to the Director of the National Gas Survey, or to such person on his staff as designated by the Director, or any other designated agents of the Federal Power Commission, and such data or reports will be composited with that submitted by other identified business enterprises and reported on a composite basis and the provisions of Section 8(b) of the Natural Gas Act [15 U.S.C. 717g(b)] and 5 U.S.C. 552 (b)(4) and (9) [the Freedom of Information Act] shall apply.

The Secretary of the Commission shall cause prompt publication of this order to be made in the Federal Register in accordance with the provisions of the Office of Management and Budget Circular No. A–63.

By the Commission.

Kenneth F. Plumb, *Secretary.*

Appendix

NATIONAL GAS SURVEY, SUPPLY-TECHNICAL ADVISORY COMMITTEE

SUPPLY-TECHNICAL ADVISORY TASK FORCE-NATURAL GAS SUPPLY

Task Force Members

Ralph W. Garrett, director, exploration analysis manager, Humble Oil & Refining Co.

Worthy Warnack, deputy director, Geologist, Humble Oil & Refining Co.

Paul J. Root, FPC survey coordinating representative and secretary, Technical Director, National Gas Survey, Federal Power Commission.

Donald L. Martin, Alternate FPC survey coordinating representative and secretary, Regional Engineer (Fort Worth) Federal Power Commission.

Edward A. Albares, FPC Representative, head, Gas Supply Section, Federal Power Commission.

Charles M. Allen, General Gas Geologist, Phillips Petroleum Co.

John F. Bricker, Chairman of the Board, Exchange Oil Corp.

G. C. Carlson, Gas Manager, Union Oil Co. of California.

F. L. Carpenter, Petroleum Engineering Advisor, Gulf Oil Corp.

William B. Cleary, Sr., President, Cleary Petroleum Corp.

John K. Drisdale, Manager of Petroleum Engineering, Texaco, Inc.

E. S. Garner, Staff Engineer, Reserves Standard Oil Co. of California.

R. E. Geiger, evaluation and analysis manager, exploration and production department, Mobil Oil Corp.

B. B. Gibbs, manager, gas availability department, United Gas Pipe Line Co.

P. N. Glover, manager of exploration economics, Shell Oil Co.

H. J. Gruy, president, H. J. Gruy & Associates, Inc.

J. M. Hanley, vice president, Northern Natural Gas Co.

Wayne H. Hardin, manager engineering and evaluation, George Mitchell & Associates.

Kenneth E. Hill, manager of corporate finance, Eastman Dillon Union Securities & Co.

Frank Jordan, economic analyst, Independent Petroleum Association of America.

Frank T. Lloyd, director of special projects, Reservoir Engineering Department, Atlantic Richfield Co.

William C. Lonquist, Jr., manager, contracts and lands, Texas Eastern Transmission Corp.

H. Alan Nelson, president, Calvert Exploration Co.

E. A. Rassinier, director of resource planning, Trunkline Gas Co.

Ralph P. Roe, staff engineer, Amoco Production Co.

Edward Symonds, senior economist, First National City Bank of New York.

SUPPLY-TECHNICAL ADVISOR TASK FORCE—REFORMER GAS

L. A. Goldstein, director, manager, crude oil supply planning, Shell Oil Co.

Dr. R. J. Howe, deputy director, coordinator, energy policy development, Humble Oil & Refining Co.

Paul J. Root, FPC coordinating representative and secretary, technical director, National Gas Survey, Federal Power Commission.

Charles A. Gallagher, alternate FPG survey coordinating representative & secretary, engineer, Federal Power Commission.

Donald E. Anderson, gas compressor superintendent, Consumers Power Co.

Murray E. Brooks, vice president of engineering, development, and resource, the Lumus Co.

John E. Cohoon, asistant vice president, the Brooklyn Union Gas Co.

C. Vernon Foster, manager, process engineering department, Continental Oil Co.

Richard Goode, vice president, Power Corp. of America.

A. Grossberg, manager, process design division, Chevron Research Corp.

John W. McCutcheon, assistant manager, economics and resources division, planning and economics department, United Gas Pipeline Co.

Appendix A

NATIONAL GAS RESERVES STUDY

The Federal Power Commission (FPC), acting through the National Gas Survey, will direct an independent estimation of proved recoverable reserves of natural gas of the United States. This estimation will deal with naturally occurring gas which analysis of geologic and engineering data demonstrates with reasonable certainty to be recoverable in the future from known oil and gas reservoirs under existing economic and operating conditions. The study will not include gas in storage.

Natural gas is defined to be a mixture of hydrocarbon compounds and small quantities of various non-hydrocarbons existing in gaseous phase or in solution with oil in natural underground reservoirs at reservoir conditions.

Reservoirs are considered proved that have demonstrated the ability to produce by either actual production or conclusive formation test.

Estimated gas reserves will be reported in cubic feet at 14.73 pounds per square inch absolute pressure and 60° F. temperature as of December 31, 1970.

All definitions and terminology will conform to that used by the American Gas Association (A.G.A.) Committee on Natural Gas Reserves as set forth in the report, "Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas in the United States and Canada and United States Productive Capacity as of December 31, 1970." and the American Petroleum Institute (API) Technical Reports Nos. 1 and 2.

I. FORMATION OF ORGANIZATION

To conduct the survey, independent experts will be employed or commissioned by the FPC and organized in four work disciplines.

(*a*) *Gas field identification* will be provided by a comprehensive list of all gas fields in the United States. The list will assure that all fields with gas reserves are identified for survey. The Oil Information Center (OIC) at the University of Oklahoma Research Institute will be commissioned by the FPC and charged with this responsibility. Mr. Jack L. Morrison is the director of the Oil Information Center.

(*b*) *Independent reserve teams* will be supervised by Mr. Lawrence R. Mangen, FPC Assistant Section Head of the Gas Supply Section. The teams are to be made up of geologists, engineers and other professional staff members of the Federal Power Commission to review data ordinarily needed to determine gas reserves, with assistance, as available, from the United States Geological Survey, United States Bureau of Mines, and from colleges and universities.

(*c*) The *independent accounting* agent will be selected by the Federal Power Commission. This agent will be commissioned by the Federal Power Commission to:

"1. Provide security for individual field reserve estimates;

"2. Classify gas fields by reserve size and age; perform random selection of fields for reserve estimations as prescribed by the statistical validation team;

"3. Consolidate the findings of the reserve teams; and

"4. Report United States gas reserves estimates to the National Gas Survey."

(*d*) A *statistical validation* team will be supervised by Dr. Marie D. Wann, Chief Mathematical Statistician, Statistical Policy Division, United States Office of Management and Budget. The team will consist of other experts from the Office of Management and Budget and others commissioned by the FPC. This team will have the responsibility of prescribing sampling procedures for valid reserve estimation.

(*e*) Task Force Advisory Sections, which shall perform as work teams and not Industry Advisory Committees, will be selected from the membership of the Supply-Technical Advisory Task Force-Natural Gas Supply. These sections will perform the tasks assigned by the Supply-Technical Advisory Task Force-Natural Gas Supply as indicated in Attachment A (Items B, F, N, P, and W) and other tasks as assigned.

SECURITY CONSIDERATIONS

Individual companies must, for competitive reasons, protect highly confidential information in competitive areas such as offshore Louisiana. The security problem will be accommodated by:

(*a*) Requiring that all company-furnished data be evaluated at the companies' offices with no data or worksheets leaving the premises. All independent reserve team generated worksheets will be preserved in the companies' offices until July 1, 1974.

(*b*) Having the complete list of A.G.A. individual field reserve estimates available only to the independent accounting agent. All these records are to be returned to the member of the A.G.A. Committee on Natural Gas Reserves assigned to the particular area involved as soon as the study is completed.

(*c*) Having the A.G.A. reserve estimates for the randomly selected sample fields for independent reserve estimation available to Mr. Lawrence R. Mangen, supervisor of reserve teams.

Detailed procedures are diagramed on the information flow chart, Attachment A. Information boxes on the chart bear the same letter designation as the corresponding descriptive paragraphs which follow.

(*a*) The National Gas Survey requests that the industry representatives who provide A.G.A. reserves also submit those reserves by fields on a confidential basis directly to the selected accounting agent.

(*b*) A natural Gas Supply Task Force Advisory Section (Item B, Attachment A) will recommend a data for recording U.S. gas fields and reserves. The format will be readily convertible to computer cards and will record the following information for each gas field:

1. A.G.A. District
2. State
3. Railroad Commission District or State Subdivision
4. Field Name or Names
5. Discovery Date
6. Gas Reserves as of December 31, 1970

(*c*) A Task Force Advisory Section (Item B, Attachment A) will meet with the industry representatives and will explain the data format. A request will be made that each A.G.A. subcommittee chairman provides the indicated data on all gas fields in his area.

(*d*) A computer card will be punched for each gas field. A computer program will be written for error checking and sorting as is needed.

(*e*) A listing of all gas fields for which reserve data has been submitted will be prepared by the accounting agent and forwarded to the Oil Information Center (OIC) at the University of Oklahoma Research Institute. This list will provide the state, field name, and discovery date—but no reserve information.

(*f*) The field list developed from the A.G.A. records will be compared by the OIC with a list from the United States Government Interagency Oil and Gas Field Study. The "government" data is presently stored by computer in a data bank at the OIC.

(*g*) Screening and verification of the field lists will be done by the OIC. This operation will reconcile field names and identify duplications and omissions. Other information sources such as U.S. government publications, state geological survey publications, and oil and gas regulatory agency publications will be used, if necessary. A task Force Advisory Section (Item F, Attachment A) of the Supply-Technical Advisory Task Force-Natural Gas Supply, will assist in clarifying field nomenclature.

(*h*) The OIC will compile the complete list of gas fields in the United States. It will include all gas fields with remaining recoverable gas reserves as of December 31, 1970. The fields will be grouped by state and substate areas. The listing will be alphabetical and will convey field name and date of discovery.

(*i*) A copy of the gas field identification list and a supplemental list of "A.G.A. omitted fields" will be forwarded by OIC to the accounting agent. National Gas Survey teams will later estimate reserves for any omitted field.

(*j*) A copy of the gas field identification list will be forwarded to the National Gas Survey together with a statement of accuracy. Both documents will appear in the final reserves publication.

(*k*) The independent accounting agent will stratify all fields in each A.G.A. subcommittee area by size and age so that a statistically valid sampling procedure can be prescribed.

(*l*) The statistical validation team will prescribe the number of fields to be surveyed independently in each A.G.A. subcommittee area by size and age category in order to project a statistically valid reserve estimation with a reasonable degree of accuracy and certainty.

Sampling will be started on a minimum basis to test the magnitude of deviation. If, in the initial field reserve estimations, the standard deviation of the percentage differences from their mean is too large to assure the desired certainty and accuracy, additional sampling will be carried out as required or the specifications will be modified. The National Gas Survey will balance the time required against the desired accuracy so as to obtain the best results in a reasonble time.

(*m*) The accounting agent will select the fields to be surveyed in each category as prescribed by the statistical validation team and will furnish a list of field names to the independent reserve team supervisor with a copy to the Task Force Advisory Section (Item N, Attachment A). The list of "A.G.A. omitted fields" will also be submitted for independent reserve estimations.

(*n*) The Task Force Advisory Section (Item N, Attachment A) will assign each sample field to a company, and will schedule reserve team visits to the various companies. Valid results will require a company to furnish data for each randomly selected field.

(*o*) Companies will prepare to furnish, if available:

1. A working area with telephone connections. Materials should include a calculator, adding machine, planimeter, and normal office work desks, tables, and equipment.

2. The type of information which may be requested of the companies for use during reserve team visits is listed for reference:

(a) For each field: It will probably be necessary to supply the following items, if available:

(1) A map of the field area showing the location and completion of all wells drilled prior to December 31, 1970.

(2) Electrical well surveys to illustrate the depth and configuration of all gas-bearing reservoirs.

(3) Core analysis needed for basic rock properties.

(4) Reservoir production histories may be needed which tabulate oil, gas, condensate and water production for each gas reservoir on a yearly basis to December 31, 1970.

(5) Specific gravity of gas.

(6) Formation temperature.

(7) Original reservoir pressure.

(*b*) For fields in which porosity-area reserve estimates have been made, the following additional information may be requested:

(1) Effective porosity-electric well surveys and core analysis. (a) Porosity. (b) Salt water saturation.

(2) Productive reservoir volume—copies of isopach maps should be available for examination. Planimetered volumes should be available.

(*c*) For fields in which pressure-volume reserve estimations have been made, the following additional information may be requested:

(1) A tabulated record of reservoir pressure measurement versus gas withdrawals.

(2) Backup data for each pressure measurement.

(*d*) Questions on interpretive data, such as estimated recovery efficiency, may be furnished by companies, if requested by the reserve teams.

(*p*) The National Gas Survey will provide an appropriate seminar for the independent reserve teams prior to beginning the field surveys. The seminar will be conducted by a team of qualified geologists; engineers and other qualified personnel selected from government agencies and/or colleges and universities. The seminar will be held at an early date for the purpose of assuring quality reserve estimations, the use of standard techniques, and definitions.

(*q*) Independent reserve estimations will be made in the offices of the various companies. Each company will furnish a qualified representative who is familiar with all the reserve data pertaining to the subject field. He will furnish these data to the reserve teams as needed and will insure that no data other than the independently derived field reserve are taken from the working area. He will be available to answer inquiries of the reserve teams but will not be a member of the team.

(*r*) Independent reserve estimations are transmitted on a confidential basis to the reserve team supervisor. The reserve team supervisor will compare the independent field reserve estimates with reserve estimates from the A.G.A. He may compare them with any other source including (but not limited to) the following:

(1) OIC Data Bank at the Oklahoma University Research Institute.
(2) Natural Gas Companies' Annual Report of Gas Supply—FPC Form 15.
(3) Industry professional publications.
(4) United States Geological Survey data.

At his discretion, he may call for a recheck of the work of the first reserve team or he may call for a re-examination of the data by a "senior reserve team" of his choice. A final reserve estimate for each field will be transmitted to the accounting agent.

(*s*) When the accounting agent has received all final reserve estimates, he determines the deviation from the mean of the sample .He forwards the deviation information to the statistical validation team.

(*t*) The statistical validation team determines the adequacy of the sample. Additional sampling will be prescribeed if it is required to obtain the desired accuracy and certainty.

(*u*) The accounting agent will randomly select the additional fields. Additional reserve estimations will be made by the reserve terms in accordance with the original procedure, and the results will be compiled and examined as before.

(*v*) When sampling is sufficient to assure the desired accuracy, the statistical validation team reports to the National Gas Survey. The report will include a description of the sampling procedure and a statement of the reliability of the survey.

(*w*) One independent reserve team will have the responsibility of compiling and reporting United States disolved gas reserve statistics as needed. The Task Force Advisory Section for dissolved gas (Item W, Attachment A) will furnish historical data.

(*x*) The accounting agent submits a report to the National Gas Survey on United States gas reserves as of December 31, 1970. When the report is accepted by the National Gas Survey, the accounting agent will dispose of all records which reflect gas reserves by field in the manner prescribed in paragraph II–B.

(*y*) The reserve team supervisor will submit a detailed summary of the methods and procedures used to make the independent reserve estimations. He will receive assistance from the personnel conducting the Reserves Seminar and will be advised by the Task Force Section on reserve determinations methods (Item P, Attachment A). The reserve team supervisor will return all A.G.A. records which reflect gas reserves by field to the member of the A.G.A. Committee on Natural Gas Reserves assigned to the particular area involved when the accounting agent's report is accepted.

(*z*) The National Gas Survey will publish its initial reserves report in the following form:

1. Complete list of gas fields in the United States by states and substate areas with year of discovery. A statement of accuracy by the Director of the Oil Information Center, University of Oklahoma Research Institute.
2. Detailed description of sampling procedures. A statement of statistical accuracy by the leader of the statistical validation team.
3. Detailed description of methods and procedures of reserve determination by the reserve team supervisor.
4. Report of reserves from the accounting agent. Report will include: (*a*) Gas field size distribution; (*b*) Gas reserves by states.
5. Recommendations relating to future estimations of national gas reserves.

EXHIBIT 7, ATTACHMENT I

TABLE VII.—SUMMARY OF ANNUAL ESTIMATES OF NATURAL GAS RESERVES IN THE UNITED STATES, FOR PERIOD DEC. 31, 1945, TO DEC. 31, 1968, TOTAL, ALL TYPES

[Millions of cubic feet, 14.73 lb/in²a, at 60° F]

Year	Natural gas added during year					Net change in underground storage	Preliminary net production during year	Estimated proved reserves as of yearend	Increase over previous year
	Extensions	Revisions	New field discoveries	New reservoir discoveries	Total of discoveries, revisions, and extensions				
1945								146,986,723	
1996	(1)		(1)		17,632,864	(1)	4,915,774	159,703,813	12,717,090
1947	7,529,538		3,391,649		10,921,187	(1)	5,599,235	165,025,765	5,321,952
1948	9,716,426		4,106,664		13,823,090	51,202	5,975,001	172,925,056	7,899,291
1949	8,017,797		4,587,818		12,605,615	82,146	6,211,124	179,401,693	6,476,637
1950	9,123,637		2,861,724		11,985,361	52,935	6,855,244	184,584,745	5,183,052
1951	12,942,930		3,022,878		15,965,808	132,030	7,923,673	192,758,910	8,174,165
1952	8,885,950		5,381,656		14,267,606	197,766	8,592,716	198,631,566	5,872,656
1953	13,298,733		7,043,200		20,341,933	[2] 513,629	9,188,365	210,298,763	11,667,197
1954	4,607,155		4,939,919		9,547,074	90,408	9,375,314	210,560,931	262,168
1955	16,209,607		5,688,009		21,897,616	87,164	10,063,167	222,482,544	11,921,613
1956	19,110,251		5,605,864		24,716,115	133,241	10,818,685	236,483,215	14,000,671
1957	11,057,932		8,950,119		20,008,051	178,761	11,439,890	245,230,137	8,746,922
1958	13,316,100		5,580,624		18,896,724	57,582	11,422,651	252,761,792	7,531,655
1959	14,852,004		5,769,245		20,621,249	160,453	12,373,063	261,170,431	8,408,639
1960	7,293,015		6,600,963		13,893,978	281,273	13,019,356	262,326,326	1,155,895
1961	10,258,692		6,907,729		17,166,421	159,544	13,378,649	266,273,642	3,947,316
1962	13,184,794		6,299,164		19,483,958	159,231	13,637,973	272,278,858	6,005,216
1963	12,586,733		5,577,934		18,164,667	253,733	14,546,025	276,151,233	3,872,375
1964	13,342,838		6,909,301		20,252,139	195,110	15,347,028	281,251,454	5,100,221
1965	14,775,570		6,543,709		21,319,279	150,483	16,252,293	286,468,923	5,217,469
1966	9,224,745	4,937,962	2,947,329	3,110,396	20,220,432	134,523	17,491,073	289,332,805	2,863,882
1967	9,538,584	6,570,578	3,170,520	2,524,651	21,804,333	151,403	18,380,838	292,907,703	3,574,898
1968	7,758,321	3,016,146	1,376,429	1,545,612	13,697,008	118,569	19,373,428	287,349,852	[4] 5,557,851

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[1] Not estimated.

[2] All native gas in storage reservoirs formerly classified as a natural gas reserve is included in this figure.

[3] Separation of revisions from extensions and of new field discoveries from new reservoir discoveries not available prior to 1966.

[4] Negative volume.

In the United States District Court for the District of Columbia

Civil Action No.———

FEDERAL TRADE COMMISSION, 6TH STREET AND PENNSYLVANIA AVENUE, NW., WASHINGTON, D.C. 20580, PETITIONER

v.

O. N. MILLER, CHAIRMAN, AND STANDARD OIL COMPANY OF CALIFORNIA, A CORPORATION, 225 BUSH STREET, SAN FRANCISCO, CALIFORNIA 94120, RESPONDENTS

Memorandum in Support of Petition for an Order Requiring Respondents to Comply with a Subpoena Duces Tecum *Issued in the Course of an Investigation Being Conducted by the Federal Trade Commission*

NATURE OF PROCEEDING

This is a summary proceeding[1] upon a petition filed pursuant to Section 9 of the Federal Trade Commission Act, 15 U.S.C. § 49, to obtain judicial enforcement of a subpoena *duces tecum* issued by petitioner Federal Trade Commission ("Commission") in the course of an investigation being conducted by the Commission under Commission File No. 711 0042.

FACTS

On June 3, 1971, the Commission issued its resolution directing the use of compulsory process in a nonpublic investigation to ascertain whether various named corporations "and other persons and corporations, individually or in concert, are engaged in conduct in the reporting of natural gas reserves for Southern Louisiana which violates Section 5 of the Federal Trade Commission Act, 5 U.S.C. § 45, or are engaged in conduct or activities relating to the exploration and development, production, or marketing of natural gas, petroleum and petroleum products and other fossil fuels in violation of Section 5 of the Federal Trade Commission Act" (Petition, Exhibit 2).

On November 24, 1971, Owen M. Johnson, Jr., Assistant Director of the Commission's Bureau of Competition, acting pursuant to said resolution and in accordance with the authority delegated to him by Section 2.7(a) of the Commission's published rules (16 C.F.R. § 2.7(a)), issued and served on O. N. Miller and Standard Oil Company of California a subpoena *duces tecum.*[2] The subpoena directed respondents to appear, testify and produce certain specified books. records and documents at an investigational hearing before an attorney examiner on December 27, 1971, at a designated place in Washington, D.C. (Petition, Exhibit 1). The information sought related primarily to natural gas and natural gas reserves. Similar subpoenas were served on ten other producers of natural gas and principal officers thereof.[3]

On December 23, 1971, Standard-California filed a motion to quash the subpoena. *See, infra*, pp. 9–48 for a discussion of the grounds of the motion. On June 27, 1972, the Commission issued its order denying the motion to quash together with an accompanying opinion giving the reason for its action (Petition, Exhibit 3).

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[1] Proceedings to enforce administrative subpoenas are special statutory matters. summary in nature, and usually are commenced by a show cause order on the named respondent by the district court. *See FTC* v. *Sherry,* Trade Reg. Rep. [1969 Trade Cases], ¶ 72,906 (D.D.C. 1969); *United States* v. *Associated Merchandising Corp.,* 256 F. Supp. 318, 321 (S.D.N.Y. 1966); *Kennedy* v. *Lynd,* 306 F. 2d 222, 225–26 (5th Cir. 1962), *cert. denied,* 371 U.S. 952 (1963); *FTC* v. *Standard Am., Inc.,* 195 S. Supp. 801, 802 (E.D. Pa. 1961), *aff'd,* 306 F. 2d 231 (3d Cir. 1962); *Long Beach Fed. Sav. & Loan Ass'n* v. *Federal Home Loan Bank Bd.,* 169 F. Supp. 589, 596 (S.D. Cal. 1960), *rev'd on other grounds,* 295 F. 2d 403 (9th Cir. 1961); *NLRB* v. *Cudahay Packing Co.,* 34 F. Supp. 53, 69 (D. Kan. 1940), *aff'd,* 117 F. 2d 692 (10th Cir. 1941); *FTC* v. *Scientific Living, Inc.,* 150 F. Supp. 495, 498 (M.D. Pa. 1957), *appeal dismissed* (3d Cir. order dated Aug. 12, 1957), *cert. denied,* 355 U.S. 940 (1958); *Goodyear Tire & Rubber Co.* v. *NLRB,* 122 F. 2d 450, 451 (6th

[2] The Subpoena was directed to "O. N. Miller, Chairman, Standard Oil Company of California" (Petition, Exhibit 1). Thus, it was a command to the corporation to produce the requested documents by Mr. Miller. *See FTC* v. *Sherry,* Trade Reg. Rep. [1969 Trade Cases], ¶ 72,906 at p. 87,454 (D.D.C. 1969); *Wilson* v. *United States*, 221 U.S. 361, 376–77 (1911); *Bowles* v. *Bay of New York Coal & Supply Corp.,* 152 F. 2d 330, 331 (2d Cir. 1945).

[3] The ten other producers on which the subpoenas were served are: Continental Oil Company, Gulf Oil Company, Mobil Oil Company, Pennzoil Company, Shell Oil Company, Standard Oil Company (New Jersey) (name subsequently changed to Exxon Corporation), Standard Oil Company (Indiana), The Superior Oil Company. Texaco. Inc.. and Union Oil Company of California.

Following the Commission's denial of Standard-California's motion to quash, counsel for Standard-California advised the Commission, on July 31, 1972, that the company did not intend to comply with the Commission's subpoena dated November 24, 1971 (Petition, Exhibit 6).

The situation, therefore, is that respondents have unequivocally refused to obey the subpoena, returnable in Washington, D.C., thus bringing into effect the jurisdiction and authority of this Court to enforce the subpoena pursuant to Section 9 of the Federal Trade Commission Act.

ARGUMENT

I. The Commission is authorized to issue the subpoena duces tecum and this Court has jurisdiction to enforce compliance with the subpoena

The authority of the Commission to issue the subpoena *duces tecum* to respondents and the jurisdiction of this Court to enter an order enforcing the subpoena is conferred by Section 9 of the Federal Trade Commission Act, 15 U.S.C. § 49, which provides as follows:

> That for the purposes of this Act the commission, or its duly authorized agent or agents, shall at all reasonable times have access to, for the purpose of examination, and the right to copy any documentary evidence of any corporation being investigated or proceeded against; and the commission shall have power to require by subpoena the attendance and testimony of witnesses and the production of all such documentary evidence relating to any matter under investigation. Any member of the commission may sign subpoenas, and members and examiners of the commission may administer oaths and affirmations, examine witnesses, and receive evidence.
>
> Such attendance of witnesses, and the production of such documentary evidence, may be required from any place in the United States, at any designated place of hearing. And in case of disobedience to a subpoena the commission may invoke the aid of any court of the United States in requiring the attendance and testimony of witnesses and the production of documentary evidence.
>
> Any of the district courts of the United States within the jurisdiction of which such inquiry is carried on may, in case of contumacy or refusal to obey a subpoena issued to any corporation or other person, issue an order requiring such corporation or other person to appear before the commission, or to produce documentary evidence if so ordered, or to give evidence touching the matter in question; and any failure to obey such order of the court may be punished by such court as a contempt thereof.

The Commission's power to conduct the inquiry herein concerned is further conferred by Section 3 of the Federal Trade Commission Act, 15 U.S.C. § 43, which provides, in part:

> The commission may, by one or more of its members, or by such examiners as it may designate, prosecute any inquiry necessary to its duties in any part of the United States.

And by Section 6(a) of the Federal Trade Commission Act, 15 U.S.C. § 46(a), which provides that the Commission shall also have power:

> To gather and compile information concerning, and to investigate from time to time the organization, business, conduct, practices, and management of any corporation engaged in commerce, excepting banks and common carriers subject to the Act to regulate commerce, and its relation to other corporations and to individuals, associations, and partnerships.

The investigation being conducted by the Commission, in the course of which the subpoena was issued, is not a formal adversary proceeding, but is for the purpose of securing facts bearing upon whether Section 5 of the Federal Trade Commission Act, which the Commission enforces, has been or may be violated.

It is well established that the Commission may require the appearance and testimony of witnesses and the production of documentary evidence in the course of conducting an investigation and that such authority is not limited to a situation where a complaint charging a violation of law has been issued.[4]

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[4] *Automatic Canteen Co. of America* v. *FTC*, 346 U.S. 61, 79 (1953: *FTC* v. *Tuttle*, 244 F. 2d 605, 615 (2d Cir. 1957), *cert. denied*, 354 U.S. 925; *FTC* v. *Waltham Watch Co.*, 169 F. Supp. 614, 619–20 (S.D.N.Y. 1959); *FTC v. Harrell*, 313 F. 2d 854, 856 (7th Cir. 1963); *FTC* v. *Standard Am., Inc.*, 306 F. 2d 231, 234–35 (3d Cir. 1962); *and see Oklahoma Press Publishing Co.* v. *Walling*, 327 U.S. 186, 201 (1946).

As stated in *United States* v. *Morton Salt Co.*, 338 U.S. 632, 652 (1950):

> Even if one were to regard the request for information in this case as caused by nothing but official curiosity, nevertheless law-enforcing agencies have a legitimate right to satisfy themselves that corporate behavior is consistent with the law and the public interest.

The Commission may "investigate merely on suspicion that the law is being violated, or even just because it wants assurance that it is not." *Id*, at 642–43.

In the instant case the inquiry as to possible violations of law relates to a situation of great public interest. The importance of natural gas to our economy and to the public welfare is beyond dispute. In setting wellhead rates for natural gas, the Federal Power Commission takes into account proved gas reserves. *See, e.g., Permian Basin Area Rate Cases*, 390 U.S. 747, 816–18 (1968): Federal Power Commission Opinion No. 598: *Area Rate Proceeding, et al.* (*Southern Louisiana Area*), Docket Nos. AR61–2, *et al.*, AR69–1, at pp. 6, 19–31, 60, 62, 63. As a general proposition, the lower the proved reserves that are considered, the higher the rate that has been allowed. Gas reserve estimates which have been considered by the Federal Power Commission in rate-making have been in the first instance compiled by employees of the major gas producers and furnished to regional subcommittees of the Committee On Natural Gas Reserves of the American Gas Association, thence through the Committee to the Federal Power Commission. It is obvious, therefore, that individual or concerted conduct of gas producers in underreporting or underestimating gas reserves could have the indirect result of the Federal Power Commission allowing higher wellhead gas rates. *See, infra*, pp. 17–18.

It is well established that any collusion or combination among common carriers underlying a rate-making proceeding before a regulatory agency is a violation of the Sherman Act which the government may challenge independently of determinations by the regulatory body with respect to the reasonableness of the rates.[5] It is equally well established that any violation of the antitrust laws or any act repugnant to the public policy embodied therein is an unfair method of competition in violation of Section 5 of the Federal Trade Commission Act.[6] The investigation to determine whether Standard-California and other corporations and persons, individually or in concert, are engaged in conduct in the reporting of natural gas reserves, or are engaged in other conduct or activities, in violation of Section 5 of the Federal Trade Commission Act is undeniably within the Commission's broad authority under the Act to prohibit unfair methods of competition and unfair or deceptive acts or practices.[7]

Commission investigations as to possible violations are analogous to those of a grand jury, and may be broad and comprehensive in the nature of grand jury investigations.[8] It is sufficient that the inquiry is within the Commission's authority, the demand is not too indefinite and the information sought is reasonably relevant.[9] The standards of relevance are far less rigid in an investigation than are required in an adversary proceeding in view of the purpose to discover evidence—not to prove a pending charge.[10] The subpoena here clearly satisfies the criteria of general relevance applicable to the investigations concerned. Further, the subpoena is presumptively correct and the burden is on any party who challenges the Commission's right to proceed.[11]

With these principles in mind we now turn to the objections to the subpoena as raised in the Motion to Quash filed with the Commission by Standard-California and demonstrate that the objections are without merit. In essence, Standard-California argues (1) that the subpoena is unreasonable and oppressive as to time and scope; (2) that the resolution, pursuant to which the subpoena was issued fails to advise or disclose sufficiently the purpose and scope of the investigation; (3) that the subpoena constitutes an unlawful attempt to interfere with the primary jurisdiction of the Federal Power Commission with respect to a matter which is under investigation by the Power Commission; (4) that the subpoena is directed to confidential information, the disclosure of which would impair the competitive position of Standard-California; and (5) that the subpoena was issued in violation of the Federal Reports Act. These objections are without merit for the reasons detailed below.

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[5] *Swift & Co.* v. *United States*, 196 U.S. 375, 396 (1905); *United States* v. *Pacific & Arctic R. & N. Co.*, 228 U.S. 87, 104–05 (1913); *Georgia* v. *Penn. R. Co.*, 324 U.S. 439, 456–59 (1945).

[6] *Fashion Originators' Guild of America, Inc.*, v. *FTC*, 312 U.S. 457, 463, 466 (1941); *FTC* v. *Motion Picture Advertising Serv. Co.*, 344 U.S. 392, 394–95 (1953); *FTC* v. *Brown Shoe Co.*, 384 U.S. 316, 320–31 (1966).

[7] *Cf., FTC* v. *Sperry & Hutchinson Co.*, 405 U.S. 233 (1972); *The Atlantic Ref. Co.* v. *FTC*, 381 U.S. 357, 367–68 (1965).

[8] *Hannah* v. *Larche*, 363 U.S. 420, 449 (1960); *United States* v. *Morton Salt Co.*, 338 U.S. at 642–43; *Oklahoma Press Publishing Co.* v. *Walling*, 327 U.S. 186, 216 (1946); *Bowles* v. *Baer*, 148 F. 2d 787, 789 (7th Cir. 1944).

[9] *Adams* v. *FTC*, 296 F. 2d 861, 866 (8th Cir. 1961), *cert. denied*, 369 U.S. 864 (1962); *FTC* v. *Green*, 252 F. Supp. 153, 156 (S.D.N.Y. 1966). *See also, United States* v. *Morton Salt Co.*, 338 U.S. at 652; *Oklahoma Press Publishing Co.* v. *Walling*, 327 U.S. at 208–09; *SEC* v. *Vacuum Can Co.*, 157 F. 2d 530, 532 (7th Cir. 1946), *cert. denied*, 330 U.S. 820 (1947); *FTC v. Waltham Watch Co.*, 169 F. Supp. 614, 621 (S.D.N.Y. 1959).

[10] *SEC* v. *Vacuum Can Co.*, 157 F. 2d at 532; *Westside Ford* v. *United States*, 206 F. 2d 627, 629–32 (9th Cir. 1953).

[11] *Kilgore Nat'l Bank* v. *Federal Petroleum Bd.*, 209 F. 2d 557, 560 (5th Cir. 1954). *See also, CAB* v. *Hermann*, 353 U.S. 322, 323 (1957).

II. Standard-California's asserted grounds before the Commission for refusing to comply with the subpoena are invalid

A. The claim that the Commission's resolution stating the nature and scope of the investigation is unduly broad and is unclear

Standard-California contends that the Commission's resolution, pursuant to which the instant subpoena was issued, is unduly broad and is unclear. See Petition, Exhibit 3, pp. 20–21 for the portion of the Commission's opinion rejecting this assertion. In assessing this contention, it must be remembered that the Commission's resolution of investigation does not constitute a complaint and that the resoluton is not to be evaluated on the basis of the requisites of a complaint.

The Federal Trade Commission is empowered and directed by Section 5(a)(6) of the Federal Trade Commission Act, 15 U.S.C. § 45(a)(6), to prevent persons, partnerships, or corporations * * * from using unfair methods of competition * * * and unfair or deceptive acts or practices * * *." The courts have repeatedly held that the Commission may exercise its "broad power of investigation and subpoena, prior to the filing of a complaint,"[12] and that the Commission, as the administrative agency charged with the enforcement of the Federal Trade Commission Act, "has a power of inquisition" which is "analogous to the Grand Jury, which does not depend on a case or controversy for power to get evidence but can investigate merely on suspicion that the law is being violated, or even just because it wants assurance that it is not."[13]

The Commission's resolution (Petition, Exhibit 2) authorized an investigation to develop facts to determine whether certain corporations, in concert with other persons and corporations, are engaged in specified conduct or activities as follows:

> [C]onduct in the reporting of natural gas reserves for Southern Louisiana which violates Section 5 of the Federal Trade Commission Act, or * * * conduct or activities relating to the exploration and development, production, or marketing or natural gas, petroleum and petroleum products, and other fossil fuels in violation of Section 5 of the Federal Trade Commission Act.

Respondent may not argue successfully that this resolution is either too broad or ambiguous, and hence that the relevancy of the material sought by the subpoena cannot be determined. We submit that the Commission's authority and the nature and scope of its present investigation are adequately reflected in the resolution. Indeed, resolutions no more specific have been held sufficient for the purpose of issuing investigational subpoenas.

In *FTC* v. *Green*, 252 F. Supp. 153 (S.D.N.Y. 1966) the respondent argued that the citation of Section 5 of the Federal Trade Commission Act and Section 2 of the Cayton Act in the resoution[14] authorizing that investigation was too broad to "offer a clue as to the subject matter of the investigation," and that since the scope and purpose of the investigation were not particularized, the relevance of the information sought by the Commission was indeterminable. *Id.* at 155-56. The court concluded, however, that citation by the Commission in its resolution of Section 5 of the Federal Trade Commission Act and Section 2 of the Clayton Act as the Statutory provisions suspected by the Commission to have been violated was sufficient as a basis for enforcement of the subpoena.

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[12] *Automatic Canteen Co. of America* v. *FTC*, 346 U.S. 61, 79 (1953); *Oklahoma Press Publishing Co.* v. *Walling*, 327 U.S. 186, 201 (1946).

[13] *United States* v. *Morton Salt Co.*, 338 U.S. 632, 642–43 (1950). *Accord, Hannah* v. *Larch*, 363 U.S. 420, 449 (1960); *Oklahoma Press Publishing Co.* v. *Walling*, 327 U.S. 186, 201 (1946).

[14] The resolution authorized an investigation of the yeast industry to determine whether the producers or distributors of compressed yeast, active dry yeast and related products were "engaged in practices in violation of Section 5 of the Federal Trade Commission Act (15 U.S.C. § 45(a)(1)) or Section 2 of the Clayton Act, as amended by the Robinson-Patman Act (15 U.S.C. § 13)." *FTC* v. *Green*, 252 F. Supp. at 154–55.

In *Far East Conference* v. *Federal Maritime Commission*, 337 F.2d 146 (D.C. Cir. 1964), *cert. denied*, 379 U.S. 991 (1965), the court held it sufficient that the purpose of the compulsory process there was set forth with reference to particular statutory provisions, as the Federal Trade Commission did here in its resolution.

Likewise, in *Pacific Westbound Conference* v. *United States*, 332 F.2d 49 (9th Cir. 1964), the court dismissed as insubstantial and frivolous the petitioner's appeal from a Federal Maritime Commission order requiring the filing with the Commission of specified documents relative to rates. The court rejected the argument that the order did not state the purpose for which it was issued, in language most appropriate here, as follows (332 F.2d at 52–53):

> That statement of purpose appears to us to be about as complete and specific as it could possibly be, considering the fact that, as the Commission has a right to do, it had not yet determined that any agreements, rates or fares were unlawful but was seeking information to ascertain the measure of compliance with the named regulatory statutes and the need of future Commission action in fulfillment of its statutory duties.

In *Westside Ford, Inc.* v. *United States*, 206 F.2d 627 (9th Cir. 1953), the court held that the stated scope and purpose of an investigation by the Office of Price Stabilization into any and all transactions of the business relating to new automobiles were sufficiently definite to determine the relevancy of material subpoenaed pursuant to that investigation. The court concluded that "the expressed purpose was to determine all conceivable questions of violation of ceiling price regulations, and the stated scope comprehended investigation of any and all transactions of appellant relating to new automobiles." 206 F.2d at 630–31. *See also, Detweiler Bros.* v. *Walling*, 157 F.2d 841, 842–43 (9th Cir. 1946).

It is manifest that the scope and purpose of the Commission's investigation are at least as specific as those in *Green, Far East Conference, Pacific Westbound Conference, Westside Ford*, and *Detweiler Bros.* Indeed, the Commission's resolution specifies most succinctly the product involved, and the acts and practices of the companies to be investigated. The purposes of the investigation, as stated in the resolution, are to determine whether the investigated companies, individually or collectively, are engaged in activities in the reporting or natural gas reserves in Southern Louisiana which violate Section 5 of the Federal Trade Commission Act and whether those companies are engaged in conduct or activities relating to the exploration and development, production, or marketing, with geographic limitation, of natural gas, petroleum and petroleum products, and other fossil fuels which also violate Section 5.

Thus, the resolution authorizing the investigation is sufficiently specific to manifest the scope and purpose of the investigation. Indeed, since the Commission has not yet determined that Section 5 of the Federal Trade Commission Act has been violated, the resolution is as specific as is reasonably possible.[15] Certainly a wide range of investigation is necessary where, as here, complex multifaceted activities are concerned and the possibilities of violation of the Commission-enforced statute are so numerous that the precise manner of possible violations cannot be known in advance. However, [i]n such a case, there is no impossible requirement of meticulous pinpointing of narrow objectives and subjects of investigations." *Westside Ford, Inc.* v. *United States*, *supra*, 206 F.2d at 631.

B. The claim that the Commission's subpoena is unreasonable and oppressive as to time and scope

It is well established that a subpoena is not unreasonable or oppressive if the documents are material and relevant to the proper purpose underlying the subpoena. *Pacific Westbound Conference* v. *United States*, 332 F.2d 49, 54 (9th Cir. 1964). The scope of the subpoena must be judged in relation to the scope of the investigation; for that reason "[b]roadness alone is not sufficient justification to refuse enforcement of a subpoena so long as the material sought is relevant." *Adams* v. *FTC*, 296 F.2d 861, 867 (8th Cir. 1961), *Cert. denied*, 369 U.S. 864 (1962). In *McPhaul* v. *United States*, 364 U.S. 372, 382 (1960), a subpoena calling for "all records, correspondence, and memoranda" relating to three subjects was held to be no more sweeping than those sustained in *Endicott*

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[15] Of course, respondent cannot argue successfully that Section 5 of the Federal Trade Commission Act is vague or overly broad so that reference to Section 5 in the resolution does not constitute notification of the purpose of the investigation. *FTC* v. *Green, supra*, 252 F. Supp. at 156. In the face of numerous challenges, section 5 has withstood close judicial scrutiny in a long series of decisions unnecessary for citation here. The scope and limits of Section 5 have been sufficiently defined, and the broad authority vested by Congress in the Commission to administer and enforce Section 5 has been repeatedly affirmed. *See, e.g., FTC* v. *Sperry & Hutchinson Co.*, 405 U.S. 233 (1972).

Johnson Corp. v. *Perkins*, 317 U.S. 501 (1943), and *Oklahoma Press Publishing Co.* v. *Walling*, 327 U.S. 186 (1946).

It is submitted that the specifications of the subpoena are not vague. They adequately describe the documents required to be produced so as to enable respondents to identify them. This is all that is required. *McPhaul* v. *United States*, 364 U.S. 372, 382 (1960); *Brown* v. *United States*, 276 U.S. 134, 143 (1928). As stated in *Adams* v. *FTC*, 296 F.2d 861, 866 (8th Cir. 1961), *cert. denied*, 369 U.S. 864 (1942):

> There is a general unanimity among the courts that a subpoena meets the requirements for enforcement if the inquiry is (1) within the authority of the agency; (2) the demand is not too indefinite, and (3) the information sought is reasonably relevant.

It is for the agency to "exercise its discretion in determining what information it will require in making the investgaton." In a subpoena enforcement proceedng "it must be judicially determined whether the agency abused its discretion." And, in making this determination of relevancy the court should lay the specifications of the subpoena alongside the complaint (or resolution of investigation). *Adams* v. *FTC*, 296 F.2d at 866–67.

There is a clear presumption of relevancy of an administrative subpoena, *FTV* v. *Standard Am., Inc.*, 306 F. 2d 231, 235 (3d Cir. 1962), and the burden is on the subpoenaed party to show otherwise. *Goldberg* v. *Truck Drivers Local Union No. 299*, 293 F.2d 807, 812 (6th Cir. 1961), *cert. denied*, 368 U.S. 938; *United States* v. *Michigan Bell Tell Co.*, 415 F.2d 1284, 1286 (6th Cir. 1969); *Kilgore Nat'l Bank* v. *Federal Petroleum Bd.*, 209 F.2d 557, 560 (5th Cir. 1954). Clearly Standard-California did not sustain its burden before the Commission of demonstrating that the subpoenaed materials were not relevant to the matter under investigation. *Local 57, Int'l Union of Operating Eng'rs (AFL–CIO* v. *Wirtz*, 346 F.2d 552, 556 (1st Cir. 1965).

Standard-California has contested the breadth of the subpoena insofar as it covers time periods varying from five to ten years. These time requirements are not, in the circumstances of this investigation. too broad.

In September 1968, the Power Commission set rates for South Louisiana. an area which accounts for about one-third of this country's gas production. These rates were set at levels considerably lower than those sought by industry.[16] In May 1969, the AGA reported an unprecedented event, a decline in national gas reserves occurring in 1968. In May 1970, the AGA reported for the year 1969 declining reserves both nationally and for the South Louisiana area.[17] Thus 1967, 1968 and 1969 are critical years to the Federal Trade Commission's investigation—1967 as the last year for which no decline was reported and 1968 and 1969 as the first years for which declines were reported. It is known with respect to offshore South Louisiana, for example, that leases are for a five-year period of time. The required drilling and exploration during the entire period prior to the year in question would furnish underlying data upon which gas reserve estimates for that year could be established and appraised. Hence an examination by the Federal Trade Commission of data going back to 1962 is not only reasonable, but absolutely essential.

As in the case of the claim of a lack of relevance, the subpoenaed party must ber the burden of supporting any changes of burdensomeness. *FTC* v. *Standard Am., Inc.*, 306 F.2d 231, 235 (3d Cir. 1962). "The burden of proving that a subpoena *duces tecum* is oppressive is on the party moving for relief on the ground. *5 Moore* ¶ 45.05 [2]." *Westinghouse Electric Corp.* v. *City of Burlington, Vermont*, 351 F.2d 762, 766 (D.C. Cir. 1965); *accord. Freeman* v. *Seligson*, 405 F.2d 1326, 1337 (D.C. Cir. 1968). Both *Westinghouse* and *Freeman* involved great quantities of government documents. *Freeman* involved a half-million documents from six agencies of the Department of Agriculture—one agency having estimated it would take the time equivalent to one-man year to comply with the subpoena. Yet, in both instances, the court found that the subpoenaed party had not sustained its burden of showing burdensomeness. Likewise, in *Genuine Parts Co.* v. *FTC*, 445 F.2d 1382, 1391 (5th Cir. 1971), the court did not find the subpoena to be burdensome even though the subpoenaed party estimated an expenditure of 1500 man-hours to respond to only a portion of the subpoena.

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[16] Federal Power Commission *Area Rate Proceeding, et al.* (*Southern Louisiana Area*), Docket No. AR61-2, 40 FPC 530 (1968).

[17] Joint Report of American Gas Association, American Petroleum Institute and the Canadian Petroleum Institute entitled *Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas in the United States and Canada as of December 31, 1968* (*May 1969*), Vol. 23, p. 126 (see Petition, Exhibit 7, Attachment I).

Joint Report of American Gas Association, American Petroleum Institute and the Canadian Petroleum Institute entitled *Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas in the United States and Canada as of December 31, 1969* (*May 1970*), Vol. 24, p. 120 (see Petition, Exhibit 7, Attachment C).

Standard-California's assertion that the subpoena is unduly burdensome stems from the extent of its operations rather than from any undue demands of the subpoena. Burdensomeness is a relative term which must be considered in light of the size of the subpoenaed party and the size and complexity of the investigation. *Application of Radio Corp. of America*, 13 F.R.D. 167, 171–72 (S.D.N.Y. 1952). The possibility of significant inconvenience to the subpoenaed party is the price which must be paid for the administration of justice and the enforcement of our laws. *Application of Consumers Union of United States, Inc.*, 27 F.R.D. 251 (S.D.N.Y. 1961) ; Application of Kelly, 19 F.R.D. 269 (S.D.N.Y. 1956)

Significantly, on November 22, 1972, Gulf Oil Co. submitted over 12,000 documents to the Federal Trade Commission, constituting what it claims to be a complete response to the subpoena issued to it, which subpoena is identical to the one here in question. Subsequently, Union Oil Co. of California has submitted numerous documents pursuant to the identical subpoena issued to it and has indicated that its response is now complete. Further, Continental Oil Co. has purportedly submitted all the documments called for by an identical subpoena served upon it,[18] except for certain files called for by Specifications G and I which are termed "bid files" (see Petition, Exhibit 7). These bid files are the subject of the subpoena enforcement action currently filed in this Court against Continental Oil Co.

SPECIFICATIONS

We submit that the foregoing fully demonstrates that there is no support to Standard-California's contentions that the specifications of the subpoena are vague, unreasonable or oppressive. The following additional and general analysis of the specifications is provided for the convenience of the Court.

Specifications A–E are basically for background purposes and have not been questioned by Standard-California. Specification F requires general information which goes to the question of public interest. It also calls for documentation as to interstate and intrastate sales which will indicate the volume of gas sales subject to Power Commission regulation. This should permit the Trade Commission to compute the approximate increase in revenue respondent stood to gain through the new and higher rates.

Specification G demands documents covering specific estimates. It should be noted that, although information is required as to total gas reserve estimates for all of South Louisiana and all of Offshore South Louisiana, the response relating to specific fields or leaseholds is limited to the Offshore South Louisiana Area. There are only approximately 200 reported fields in that offshore area (see Petition, Exhibit 7). As 1967 was the last "normal" year before AGA statistics started plummeting and the terms for offshore leases is five years, the time period covered in the subpoena, *i.e.*, back to 1962, will include the documents containing information about most estimates for fields in existence in the critical years of 1967, 1968 and 1969. Specification G details as carefully as possible the type of documents which may contain estimates for whatever purpose compiled, all or any of which may indicate the accuracy of the estimates supplied to the AGA. Such information as has already been submitted to the Trade Commission is excluded.

Specification H, which is limited to the fields and leaseholds, or parts thereof, for which estimates are to be reported in Specification G, demands the technical underlying data concerning the particular operations of respondent in this area. This information should provide the Commission with information necessary to help in ascertaining the accuracy and completeness of all of the estimates supplied in response to Specification G. It would also provide the Commission with the names of additional parties who might be privy to or have their own estimates as to the acreages involved.

Specification I requires the production of documents containing data underlying the estimates provided in response to Specification G as well as any other commentaries or information concerning the reporting of estimates and the procedures used therein. This specification is limited, for the most part, to total reserves reported for AGA geographical areas, the nation as a whole or to other estimates relating to individual fields in the Offshore South Louisiana Area. Specifications J and K require the production of other documents containing specific information as to specified circumstances that may have occurred in connection with the reporting of gas reserves or other problems associated with such reporting. Finally, Specification L calls for the identification of respondent's employees or other persons who, with regard to South Louisiana, may have been involved in the activities under investigation.

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[18] Until these submissions have been completely reviewed and until knowledgeable company officials are questioned at a hearing, the completeness of these responses cannot be vouchsafed at this time.

In sum, any difficulty of compliance that Standard-California may experience is due to the size of its operations. The subpoena demands are relevant, and the time period for which the documents are demanded is clearly not unreasonable for the type of antitrust investigation being conducted. The specifications are not overly vague, as the documents demanded are described as specifically as possible under the circumstances of such an investigation and the terms used are defined according to industry standards.

We need not dwell on Standard-California's contention that the time period for compliance set forth in the subpoena is patently unreasonable. The time specified in the subpoena was, as is ordinarily the case in similar situations, for the purpose of the *initial* compliance. It is understood that therefore the Commission will grant reasonable extensions of time upon a showing of need by Standard-California. It is clear that the Commission lacks specific knowledge of what documents exist and in what form, and how much time is required for a good faith compliance. Therefore, the claimed unreasonableness of the time period is clearly not such a fatal defect as to render the subpoena invalid. Rather, it is a matter for negotiation once bona fide attempts at compliance have commenced. The proposed order submitted to the Court leaves the data of return of the subpoena open, and the Commission will entertain requests for extensions of time, as the circumstances may warrant once compliance has begun. Indeed, the Commission has pointed out that "the reasonableness of the time allowed for compliance with the subpoena is best left for resolution between (the company) and Commission staff pursuant to Section 2.7 of the Commission's Rules of Practice" (Petition, Exhibit 3, p. 13).

C. The claim that the subpoena is invalid by reason of seeking documents in an area where allegedly exclusive and primary jurisdiction rests with, and is being exercised by the Federal Power Commission.

Standard-California contends that the subpoena is invalid inasmuch as the Federal Power Commission has exclusive jurisdiction to regulate natural gas rates and allegedly has exclusive and primary jurisdiction over all matters relating thereto, including the manner in which gas producers report their reserves. See Petition, Exhibit 3 pp. 3-10, for the portion of the Commission's opinion rejecting this allegation. The very statement of the assertion, however, demonstrates its invalidity. For the Federal Power Commission's jurisdiction is over the *reasonableness* of gas rates and the Federal Trade Commission's investigation involves primarily an entirely different subject—the possible collusion in underreporting gas reserves in violation of Section 5 of the Federal Trade Commission Act.

Section 5(a)(6) of the Federal Trade Commission Act, 15 U.S.C. § 45(a)(6), which directs the Federal Trade Commission to prevent persons, partnerships and corporations from using unfair methods of competition and unfair or deceptive acts or practices, exempts only "banks, common carriers subject to the Acts to regulate commerce, air carriers, and foreign air carriers subject to the Federal Aviation Act of 1958, * * * (and those) subject to the Packers and Stockyards Act, 1921, as amended," with certain exceptions. Section 6(a) of that Act, 15 U.S.C. § 46(a), which empowers the Federal Trade Commission to investigate the organization, business, conduct, practices and management of any corporation engaged in commerce, exempts only "banks and common carriers subject to the Act to regulate commerce."

Thus, natural gas companies are not included in the enumerated exceptions to Sections 5 and 6 of the Federal Trade Commission Act and so belong to the class as to which the Federal Trade Commission is directed to prevent the use of unfair methods of competition and unfair or deceptive acts or practices and are included in the general category of corporations subject to the Federal Trade Commission's investigatory power.

As noted, *supra*, pp. 7–8, any collusion or combination among common carriers underlying a rate-making proceeding before a regulatory agency violates the Sherman Act and may be challenged independently of the rate-making determination of the regulatory body, and any violation of the antitrust laws or any act contra to the public policy thereof is an unfair method of competition violative of Section 5 of the Federal Trade Commission Act. In sum, collusion in under-reporting natural gas reserves and other collusive acts of natural gas companies in restraint of trade would violate Section 5 of the Federal Trade Commission Act; the Commission is authorized to inquire about such conduct; and the subpoena which seeks information relevant to such matter should be enforced.

The Federal Trade Commission's jurisdiction, by virtue of the Federal Trade Commission Act, over natural gas producers, including Standard-California, and its authority to conduct the investigation in question is clear. And this jurisdiction and authority has not been displaced or modified by the Natural Gas Act. The Natural Gas Act has not empowered the Federal Power Commission to determine antitrust law issues as such or as to grant antitrust immunity to any natural gas company. The exclusive jurisdiction and power of the Power Commission to determine just and reasonable rates for natural gas does not preclude the Trade Commission from investigating a possible unlawful collusion underlying natural gas rate proceedings even though the documentary material sought by the Trade Commission may also be relevant to a rate-making determination by the Power Commission.

Under the Natural Gas Act, 15 U.S.C. § 717, *et seq.*, natural gas companies are subject to the jurisdiction of the Federal Power Commission with respect to certain aspects of their business operations including construction of pipe lines and wholesaling of natural gas in interstate commerce. While the Power Commission has been judicially directed to take into account antitrust considerations in its certification proceedings as a factor relevant to the issue of public interest, convenience and necessity, *e.g., Northern Natural Gas Co.* v. *FPC*, 399 F.2d 953, 961 (D.C. Cir. 1968), it has been settled that the Natural Gas Act does not evince such a "pervasive regulatory scheme" as to evidence a congressional intent to displace the antitrust laws. *California* v. *FPC*, 369 U.S. 482 (1962). There the Court stated (369 U.S. at 485) (citations omitted):

> Immunity from the antitrust laws is not lightly implied. * * * Here, * * *, while antitrust considerations are relevant to the issue of "public interest, convenience, and necessity," there is no "pervasive regulatory scheme" including the antitrust laws that has been entrusted to the [Power] Commission.

In the *California* case, the Supreme Court held that the certification of a natural gas merger by the Power Commission under Section 7 of the Natural Gas Act, 15 U.S.C. § 717(c), did not immunize that merger from a Government challenge under Section 7 of the Clayton Act, 15 U.S.C. § 18, and that the Power Commission should await the outcome of a pending suit brought by the Government under Section 7 of the Clayton Act. Significantly, Section 7 of the Clayton Act is enforced by the Federal Trade Commission as well as by the Department of Justice. There would be no basis for arguing that the Natural Gas Act somehow displaces the Trade Commission's authority to enforce its organic act, the Federal Trade Commission Act, despite the fact that it has no such effect upon its authority under the Clayton Act.

The *California* case controls the instant situation. The principle expressed in *California* has most recently been reaffirmed and applied by the Supreme Court in *Otter Tail Power Company* v. *United States*, 41 U.S. L. Week 4292, 4294–95 (Feb. 22, 1973).[19] Unlike certain other agencies such as the Interstate Commerce Commission, the Power Commissioner has neither the power to enforce the Clayton Act nor the authority to confer antitrust immunity upon any natural gas company. Above all, it has no power to enjoin natural gas companies from engaging in unfair methods of competition or unfair or deceptive acts or practices as proscribed in Section 5 of the Federal Trade Commission Act. A fortiori, the Natural

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[19] *Also see United States* v. *Pacific & Arctic Co.*, 228 U.S. 87 (1913) (Interstate Commerce Act is no bar to an antitrust suit charging a carrier with unlawful coercion); *United States* v. *Borden Co.*, 308 U.S. 188 (1939) (Neither the Agricultural Adjustment Act nor the Capper-Volstead Act displaced the Sherman Act); *Georgia* v. *Pennsylvania R. Co.*, 324 U.S. 439 (1945) (Interstate Commerce Act is no bar to an antitrust suit charging a carrier with unlawful combination); *United States* v. *Radio Corp. of America*, 358 U.S. 334 (1959) (Federal Communications Act is no bar to an antitrust suit against TV and radio licensees); *Pan Am. World Airways* v. *United States*, 371 U.S. 296 (1963) (Federal Aviation Act does not completely displace antitrust laws); *Silver* v. *New York Stock Exch.*, 373 U.S. 341 (1963) (Securities Act does not completely displace antitrust laws); *United States* v. *Philadelphia Nat'l Bank*, 374 U.S. 321 (1963) (Bank Merger Act of 1960 does not confer immunity from Section 7 of the Clayton Act); *Carnation* v. *Pacific Westbound Conference*, 383 U.S. 213 (1966) (Shipping Act of 1916 does not completely displace antitrust laws with respect to the shipping industry).

Gas Act did not displace any antitrust law or render Section 5 of the Federal Trade Commission Act inapplicable to natural gas companies.[20]

The Power Commission's power under Sections 4 and 5 of the Natural Gas Act, 15 U.S.C. §§ 717c, 717d, is limited to the removal of natural gas rates and practices which are unjust, unreasonable, discriminatory or preferential. It has no power to proceed against or dissolve unlawful combinations or collusions. Indeed, the Natural Gas Act does not purport to confer antitrust immunity upon any natural gas company with respect to its rates or practices.

Even with respect to common carriers subject to the regulatory jurisdiction of the Interstate Commerce Commission (an agency which, unlike the Power Commission, is empowered to enforce the Clayton Act, to enjoin unfair methods of competition, or to grant antitrust immunity in certain respects), the Government is not barred from an antitrust suit if the challenged acts or transactions lie without the antitrust issues the agency had the power to decide or beyond the immunity it had the power to grant.

The power of the Government to attack, under the Sherman Act, collusion, combination or coercion of common carriers related to rate-making is not open to question where the purpose of the challenge is not to set aside the rate determination of the regulatory body, but is to dissolve the underlying collusion or combination claimed to exist. *United States* v. *Pacific & Arctic Co., supra*, 228 U.S. at 104; *Georgia* v. *Pennsylvania R. Co., supra*, 324 U.S. at 456–63.

In the *Georgia* case, the Supreme Court rejected a contention that Georgia's suit alleging conspiracy to fix joint through rates by common carriers and seeking injunctive relief under Section 16 of the Clayton Act was an impermissible attempt to trench upon the primary jurisdiction of the Interstate Commerce Commission.[21] The Court concluded (324 U.S. at 455–56):

> The relief which Georgia seeks is not a matter subject to the jurisdiction of the [Commerce] Commission. Georgia * * * is not seeking an injunction against the continuance of any tariff. * * * She merely asks that the alleged rate-fixing combination and conspiracy among the defendant-carriers be enjoined. * * * [T]hat is a matter over which the [Commerce] Commission has no jurisdiction.
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> * * * But Congress has not given the [Commerce] Commission comparable authority to remove ratemaking combinations from the prohibitions contained in the antitrust laws. * * * Nor has it empowered the Commission to proceed against such combinations and through cease and desist orders or otherwise to put an end to their activities. Regulated industries are not *per se* exempt from the Sherman Act.

The Court also rejected as irrelevant the Commerce Commission's authority to remove discriminatory rates alleged to exist and the fact that the Commission had already taken some action in that regard, stating (324 U.S. at 459–60):

> The present [suit] does not seek to have the court act in the place of the Commission. *It seeks to remove from the field of rate-making the influences of a combination which exceed the limits of the collaboration authorized for the fixing of joint through rates,* * * * . *That is not to under cut or impair the primary jurisdiction of the Commission over rates.* [Emphasis added.]

The *Georgia* case is dispositive of Standard-California's argument that the Trade Commission's investigation directed to possible collusion in the reporting of natural gas reserves unlawfully interferes with the Power Commission's exclusive jurisdiction over natural gas rates. And see *United States* v. *Radio Corp. of America*, 358 U.S. 334, 347 (1959). Also see *American Cynamid Co.* v. *FTC*, 363 F.2d 757 (6th Cir. 1966), 401 F.2d 574 (6th Cir. 1968), *cert. denied*, 394 U.S. 920 (1969), where the requirement of the Patent Office to consider the truthfulness of representations before it in a patent proceeding was held not to preclude the Trade Commission from investigating alleged fraudulent misrepresentations to the Patent Office if such misrepresentations would violate Section 5 of the Federal Trade Commission Act, and the Trade Commission's power to require as a remedy compulsory licensing of the drug on a reasonable royalty basis was sustained.

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[20] That the Power Commission has not been given the responsibility of enforcing the antitrust laws in the natural gas industry is further evidenced by Section 20(a) of the Natural Gas Act, 15 U.S.C. § 717s(a), which directs that Commission to "transmit * * * evidence concerning apparent violations of the Federal antitrust laws to the Attorney General, who in his discretion, may institute the necessary criminal proceedings." See *California* v. *FPC, supra*, 369 U.S. at 486. This provision is consistent with the Trade Commission's exercise of its Section 5 jurisdiction and power to institute civil proceedings against natural gas companies, and does not evidence a congressional intent to vest an exclusive antitrust jurisdiction in the Department of Justice.

[21] Even the four dissenting Justices did not question the Government's right to bring an antitrust suit to dissolve a conspiracy underlying the fixing of joint rates by carriers. 324 U.S. at 482.

While we have demonstrated that the subject matter of the Trade Commission's investigation is within its jurisdiction and authority, it is axiomatic that the Commission is authorized to secure by compulsory processes information which may be necessary to determine its jurisdiction. The Supreme Court has been emphatic in holding that district courts should enforce administrative subpoenas upon a preliminary showing that the subject matter of the inquiry is generally within agency jurisdiction without first passing on the sufficiency of the showing of coverage with respect to the particular transactions or acts involved in the inquiry. *FTC* v. *Crafts*, 355 U.S. 885 (1957); *reversing per curiam*, *Crafts* v. *FTC*, 244 F.2d 882 (9th Cir. 1957); *Endicott Johnson Corp.* v. *Perkins*, 317 U.S. 501–09 (1943); *Oklahoma Press Publishing Co.* v. *Walling*, 327 U.S. 186, 199–201 (1946).

In *Oklahoma Press Publishing Co.*, the Wage and Hour Administrator had issued an investigational subpoena under Sections 9 and 11 of the Fair Labor Standards Act. The subpoena power was conferred through adoption of Sections 9 and 10 of the Federal Trade Commission Act. Section 11 of the Fair Labor Standards Act authorized general and specific investigations by the Administrator. Rejecting the argument that the district court had to pass on the question of coverage before it enforced the subpoena, the Court concluded (327 U.S. at 214):

> We think * * * that the courts of appeals were correct in the view that Congress has authorized the Administrator, rather than the district courts in the first instance, to determine the question of coverage in the preliminary investigation of possibly existing violations; in doing so to exercise his subpoena power for securing evidence upon that question, by seeking the production of petitioners' relevant books, records and papers; and, in case of refusal to obey his subpoena, issued according to the statute's authorization, to have the aid of the district court in enforcing it.

This language applies to the instant proceeding with equal force. Also see *Myers* v. *Bethlehem Corp.*, 303 U.S. 41, 47–52 (1938) and the Court's discussion of *Myers* in *Oklahoma Press Publishing Co.*, *supra* 327 U.S. at 211–13.

In sum, the subject matter of the Commission's preliminary investigation is within its jurisdiction under the Federal Trade Commission Act, Standard-California is in the class subject to the Commission's inquiry, and the administrative subpoena seeks to secure information which the Commission is by law authorized to obtain. Therefore, under the controlling decisions of the Supreme Court, the Commission is entitled to enforcement of its subpoena without first litigating the question of coverage.

A related question is whether, although the Trade Commission is not by law precluded from prosecuting the instant investigation, comity dictates that the Commission's subpoena not be enforced in the light of data already secured and to be secured by the Power Commission in the course of the discharge by it of its functions. See Petition, Exhibit 3, pp. 7–10, for the Federal Trade Commission's evaluation that the data considered by the Power Commission was either not sufficient for the Federal Trade Commission's purposes or was not available to it.

The Trade Commission is entitled to make its own determination as to what it needs to conduct its investigation and may not be limited to the data the Power Commission deemed sufficient for its purpose. In *Penfield Co.* v. *SEC*, 330 U.S. 585, 592 (1957), the Supreme Court upheld the propriety of a subpoena even though many books and records had been examained in the course of a prior criminal trial, stating:

> The thought apparently is that the Commission had probed enough into Penfield's affairs. But the District Court did not hold that the Commission's request had become moot, that the documents [previously] produced satisfied its legitimate needs, or that the additional ones sought were irrelevant to its statutory functions. We agree with the Circuit Court of Appeals that at least in absence of such a finding, the refusal of the District Court to grant the full remedial relief which the Act places behind the orders of the Commission was an abuse of discretion.

And in *FTC* v. *Dilger*, 276 F.2d 739, 745 (7th Cir. 1960), the Court said:

> We further hold with the Commission that the district court did not err in refusing to hear evidence offered by appellant for the purpose of showing that the Commission had in its record evidence sufficient to enable it to decide the issue before it without the documents called for by the subpoena. The district court properly observed that the state of the record before the Commission was not in issue before it.

The Trade Commission's investigation focuses primarily on South Louisiana and in-depth data is required only with regard to the offshore area of South Louisiana. As shown more fully below, while producers, in connection with an Uncommitted Reserve Study conducted by the Power Commission, made certain data available to that Commission relative to certain fields in offshore South Louisiana, the Power Commission (1) has never had access to producer data pertaining to most fields in that area, (2) has never compared any estimates it has made with American Gas Association ("AGA") estimates, because it has never had access to any field by field AGA estimates and (3) had destroyed such estimates based on producer data as it has made. Nor will a complete investigation of offshore South Louisiana be forthcoming in connection with the Power Commission's pending National Gas Reserve Study, which was instituted some six months after commencement of the instant investigation.

When the Power Commission grants a certificate for the construction of interstate pipelines, reserves actually dedicated to *those* pipelines are reported annually to the Power Commission by the pipeline company. These figures, however, do not reflect the proved reserve estimates of the *producers* themselves. They relate only to those reserves which have been slated for shipment through the particular pipelines, and do not include the gas which will not be shipped in interstate commerce. Also, the reported figures may be based upon diverse geoloigcal measurement systems.[22]

The only producer data in the possession of the Power Commission are the *final* reserves estimated for various areas, which channelled through the American Gas Association. There are more than 300 voting members in the American Gas Association. These voting members are either gas wholesalers (*e.g.*, Washington Gas Light Company) or gas pipeline companies. In addition, there are over 600 nonvoting associate members, comprised of natural gas producers, manufacturing companies, and consultants. The Board of Directors of the AGA authorized the formation of the Committee on Natural Gas Reserves in 1945.[23]

This Committee reports an annual estimate of the reserves of proven natural gas in the United States.[24] This report is compiled from regional totals supplied by ten subcommittees, each of which is responsible for one geographic region and each of which is headed by a member of the Committee on Natural Gas Reserves.[25] The chairman of each of the 10 subcommittees has generally been an employee of a major natural gas producer.[26] The subcommittee responsible for South Louisiana is the South Louisiana Subcommittee on Natural Gas Reserves. Nine of the members of the Subcommittee including its chairman, are employes of the producers subpoenaed under the surrent Commission investigation. Each subcommittee member is assigned to report on those fields in which his employer has a proprietary interest. Each such member brings in his final estimates for his assigned fields to a meeting of the subcommittee. No underlying data is brought to this meeting.[27] The estimates of each member are totaled by the subcommittee chairman, who brings only this total to the meeting of the main Committee.[28] The AGA then issues its annual report. Because of these procedures, the accuracy of these reports cannot be checked.

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[22] See pp. 66–68 of deposition of B. B. Gibbs, Chairman of the South Louisiana Subcommittee of the American Gas Association (Petition, Exhibit 7, Attachment A).

[23] See "prepared testimony" of John C. Jacobs, Jr., Chairman of the American Gas Association Committee on Natural Gas Reserves, in Federal Power Commission *Area Rate Proceeding, et al.* (*Southern Louisiana Area*), Docket No. AR69–1, pp. 1412–13 (Petition, Exhibit 7, Attachment B).

[24] This report is entitled *Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas in the United States and Canada*. It is published jointly by the American Gas Association, Inc., American Petroleum Institute, and the Canadian Petroleum Association in May of every year covering the previous year.

[25] *See, e.g., Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas in the United States and Canada* as of December 31, 1969, Vol. 24 (May 1970), pp. 92–93 (Petition, Exhibit 7, Attachment C).

[26] See answers 30a and 30b of John C. Jacobs, Jr., to Federal Trade Commission questionnaire dated December 24, 1970 (Petition, Exhibit 7, Attachment D).

[27] See pp. 8, 15–19, 77–79, 98 of deposition of B. B. Gibbs (Petition, Exhibit 7, Attachment A).

[28] See "prepared testimony" of John C. Jacobs, Jr., in Federal Power Commission *Area Rate Proceeding, et al.* (*Southern Louisiana Area*), Docket No. AR69–1, p. 1422 (Petition, Exhibit 7, Attachment B).

As for the Power Commission's rate-making proceeding involving the South Louisiana Area (Docket Nos. AR61-2, et al., and AR69-1), neither it nor the *Uncommitted Reserves Study*, which was instituted as a part thereof,[29] has produced or is likely to produce the kind and quality of information now sought by the Trade Commission. *First*, the Power Commission's audit was principally with regard to uncommitted reserves. *Second*, the underlying data was kept at the offices of the producers, and is not now available to either the Power Commission or the Trade Commission. *Third*, the questionnaires were never made public and were returned to the producers. *Fourth*, no data was removed from the offices of the producers and the audit workpapers were destroyed. *Fifth*, the Power Commission did not verify the completeness of the reports either in terms of reporting producers or questionnaires.[30]

Also, in the *Uncommitted Reserves Study*, the Power Commission did not conduct a check to determine the accuracy of American Gas Association proved reserve figures but only to determine the accuracy of certain producer figures submitted to the Power Commission.[31]

After the Trade Commission instituted the instant investigation in June 1971, the Power Commission, on December 21, 1971, launched a National Gas Survey which had been announced in February 1971, and directed a survey of natural gas reserves *as of December 31, 1970*, to proceed immediately.[32] However, the gas reserve data to be secured by the Power Commission will not enable the Trade Commission to make the determination of the issues involved in the Trade Commission investigation. Most important, the *Power Commission study will be conducted on a random sampling basis, there will be no cross-referencing of reserve estimate data from one company to another, and the study covers only 1970 and does not include 1968 and 1969, two crucial years in the Trade Commission investigation.*[33] Apart from the adequacy of such procedures for the purpose of rate-making, they are clearly inadequate for the purpose of the Trade Commision investigation.

In short, neither the doctrine of primary jurisdiction nor the principle of comity precludes the enforcement of the Trade Commission subpoena by this Court.

D. The claim that the subpoena should not be enforced with respect to documents containing allegedly confidential commercial information

Standard-California asserts that the subpoena should not be enforced with respect to documents which allegedly contain confidential information, contending that such information will not be adequately protected from unwarranted disclosure which will impair the competitive position of Standard-California. See Petition, Exhibit 3, pp. 19–20, for the portion of the Commission's opinion rejecting this contention.

In acting upon the Commission's petition for enforcement of the subpoena, the Court need not determine whether any of the documents subpoenaed contain confidential information for (a) it is well settled that the Commission is empowered to secure confidential information or trade secrets, and (b) the information sought by the instant subpoena will be adequately protected from unwarranted disclosure.

Courts have uniformly upheld the Commission's authority to subpoena allegedly confidential documents.[34] Even in private antitrust suits, the alleged confidentiality of demanded material has been held not to preclude enforcement of the demand.[35]

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[29] See the Power Commission order dated March 17, 1970 (43 F.P.C. 444) (Petition, Exhibit 7, Attachment E).

[30] See the testimony of Mr. Lawrence R. Mangen, Assistant Section Head of the Gas Supply Section, Federal Power Commission in Federal Power Commission *Area Rate Proceeding, et al.* (*Southern Louisiana Area*), AR69–1 at Tr. 5191–92, 5196, 5200, 5430, 5446 (Petition, Exhibit 7, Attachment F).

[31] *Ibid.* at p. 5191.

[32] See Federal Power Commission Orders of February 23, 1971, and December 21, 1971 (Petition, Exhibit 7, Attachments G and H).

[33] See Appendix A of the Federal Power Commission Order of December 21, 1971 (Petition, Exhibit 7, Attachment H).

[34] *See, e.g., FTC* v. *Tuttle,* 244 F. 2d 605, 616 (2d Cir. 1957); *FTC* v. *Green*, 252 F. Supp. 153, 159 (S.D.N.Y. 1966); *FTC* v. *Waltham Watch Co.*, 169 F. Supp. 614 (S.D.N.Y. 1959); *FTC* v. *Bowman,* 149 F. Supp. 624 (N.D. Ill. 1957), *aff'd,* 248 F. 2d 456 (7th Cir. 1957); *FTC* v. *Menzies,* 145 F. Supp. 164 (D. Md. 1956), *aff'd,* 242 F. 2d 81 (4th Cir. 1957), *cert. denied,* 353 U.S. 957.

[35] *E.g., Gordon, Wolf, Cowen Co., Inc.* v. *Independent Halvah & Candier, Inc.,* 9 F.R.D. 700 (S.D.N.Y. 1949); *Seff* v. *General Outdoor Advertising Co.,* 11 F.R.D. 598, 599 (N.D. Ohio 1951); *Caldwell Clements, Inc.* v. *McGraw-Hill Pub. Co., Inc.,* 12 F.R.D. 531 (S.D.N.Y. 1952); *Radio Corporation of America* v. *Rouland Corp.,* 18 F.R.D. 440 (N.D. Ill. 1955); *Service Liquor Distributors, Inc.* v. *Calvert Distillers Corp.,* 16 F.R.D. 507, 509 (S.D.N.Y. 1955).

Significantly, the information requested from respondents is being sought as part of a *nonpublic* investigation. Information so received by the Commission is not, as a matter of routine, released to the public.

Section 6(f) of the Federal Trade Commission Act, 15 U.S.C. § 46(f), specifically exempts trade secrets and names of customers from the information which the Commission may disclose. And Section 10 of the Act, 15 U.S.C. § 50, provides severe criminal sanctions for unauthorized disclosure by Commission personnel of any information obtained by the Commission. Section 4.10 of the Commission's Rules of Practice, in accordance with the Freedom of Information Act, 5 U.S.C. § 552, protects not only commercial or financial information obtained from a person and privileged or confidential (§ 4.10(a)(2)), but aslo "geological and geophysical information and data, including maps, concerning walls" (§ 410(a)(7)). Disclosure of such information contained in Commission files can result only from a determination by the full Commission pursuant to Section 4.11(b) of the Commission's Rules.

Although Commission Rules permit the use of confidential information in the course of adjudication,[36] it is obvious that it cannot now be determined whether a Commission complaint charging a violation of law will ultimately issue. If such a complaint should issue, respondent would have ample opportunity under Section 3.45 of the Commission Rules of Practic, 16 CFR 3.45, to seek in camera treatment of any confidential information furnished to the Commission pursuant to the instant subpoena. Such protection is sufficient according to *FTC* v. *Menzies*, 145 F. Supp. 164 (D. Md. 1956), *aff'd.* 242 F.2d 81, *cert. denied*, 353 U.S. 959 (1957), in which the Court said of the Commission's authority to acquire information (145 F. Supp. at 171):

> No part of the documentary evidence should be made public and available to the competitors of the several respondent corporations *unless it is necessary to do so in the proper enforcement of the law.* If requested by the respondents, *the Commission should follow its practice of placing the documents offered in evidence in a confidential file,* in order to keep business secrets away from the sight and knowledge of the respondents' competitors *so far as it is practicable to do so in the discharge of the Commission's responsibilities under the law.* [Emphasis supplied.[37]]

The Commission need not give prior assurances of confidential treatment to respondent. See *FCC* v. *Schreiber*, 381 U.S. 279 (1965) (where the Court so held with respect to confidential information required to be furnished to the Federal Communications Commission pursuant to subpoena in a *public* investigational hearing). *Schreiber* constitutes clear authority for enforcement of the Federal Trade Commission's subpoena, where, as here, it is returnable in a *nonpublic* investigation, without regard to the alleged confidential nature of the documents called for.[38]

E. The claim that the subpoena is defective by reason of not having been cleared by the Director of the Office of Management and Budget in accordance with the Federal Reports Act of 1942.

Standard-California asserts that inasmuch as the Commission has issued identical subpoenas to eleven companies, the subpoenas are invalid by reason of the Commission's failure to have secured clearance pursuant to the requirements of the Federal Reports Act of 1942, 44 U.S.C. §§ 3501–3511. See Petition, Exhibit 3, pp. 14–18, for the portion of the Commission's opinion rejecting this assertion.

Standard-California relies upon Section 5 of the Federal Reports Act of 1942, 44 U.S.C. § 3509, which provides as follows:

> A Federal agency may not conduct or sponsor the collection of information upon identical items, from ten or more persons, other than Federal employees, unless, in advance of adoption or revision of any plans or forms used in the collection—
>
> (1) the agency has submitted to the Director the plan or forms,

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[36] Federal Trade Commission Rules of Practice and Procedure, Section 3.43(c), 16 CFR 3.43(c) and Section 4.10(a)(5), 38 Fed. Reg. 1732 (1973).

[37] See *FTC* v. *Hallmark, Inc.*, 265 F. 2d 433, 439 (7th Cir. 1959): As the investigation is not a public one and the documents will routinely go into the Commission's files, we do not reach the issue of whether or not the documents contain trade secrets.

[38] *See also, Grove Laboratories, Inc.* v. *Dixon*, Civil Action No. 3395–61 (D.D.C.) (Order, January 29, 1964), where this Court directed that the plaintiff, a party then being investigated by the Federal Trade Commission, comply with a Commission order to file a special report with the agency pursuant to Section 6(b) of the Federal Trade Commission Act, 15 U.S.C. § 46(b), *without being afforded assurances (other than as provided by statute and regulation) of confidential treatment by the Commission of the information so furnished.*

> together with copies of pertinent regulations and of other related materials as the Director of the Bureau of the Budget has specified, and
>
> (2) the Director has stated that he does not disapprove the proposed collection of information.

Thus, clearance must be obtained from the Director of the Bureau of the Budget (Now Office of Management and Budget) when Federal agency seeks to collect information upon identical items from ten or more persons.

The Commission's subpoenas to the eleven gas producers are not subject to the clearance requirement of the Federal Reports Act because they do not constitute a "collection of information" within the meaning of the Act. The term "information," as used in the Federal Reports Act, has been given a precise and limited definition as follows (44 U.S.C. § 3502) :

> "[I]nformation" means *facts obtained or solicited by the use of written report forms, application forms, schedules, questionnaires, or other similar methods calling either for answers to identical questions* from ten or more persons other than agencies, instrumentalities, or employees of the United States or for answers to questions from agencies, instrumentalities, or employees of the United States *which are to be used for statistical compilations of general public interest.* [Emphasis supplied.]

It is apparent that the subpoena does not fit within the statutory definition or "information." *First*, under the definition, the facts must be obtained "by the use of written report forms, application forms, schedules, questionnaires, or other similar methods" calling "for answers to identical questions." Clearly, the subpoena is not a form, schedule, questionnaire, or similar device calling for answers to questions. It does not ask questions; it does not call for the development of answers to questions. Rather, it calls for the production of documents which must exist prior to its return date. A party may not be compelled by a subpoena to prepare any documents or other information.

Further, the statutory definition of information is limited in terms of the use to which it is to be put. Specifically, information means "facts * * * to be used for statistical compilations of general public interest." As stated in the Commission's resolution (Petition, Exhibit 2), the purpose of the subpoena is to develop information necessary to determine whether certain practices of respondent violate Section 5 of the Federal Trade Commission Act. In short, the subpoena was issued for law enforcement purposes and not for statistical gathering purposes as is required to make the Federal Reports Act applicable.

In addition to the express statutory definition of information, the Federal Reports Act, considered as an integral whole, also supports the conclusion that the clearance requirement does not apply to information collected for law enforcement purposes by independent regulatory agencies such as the Federal Trade Commission.

The Act gives various powers to the Director of the Office of Management and Budget with respect to controlling the collection of information. The Director is authorized to approve or disapprove the request for information, 44 U.S.C. § 3509, to designate one agency as an information collecting agency to satisfy the needs of two or more agencies, 44 U.S.C. § 3504, and to determine, upon either the request of a party having a substantial interest or upon his own motion, whether the collection of the information is necessary for the proper performance of the functions of the agency, 44 U.S.C. § 3506. This Section permits the Director to hold a hearing at which the agencies and "any other interested persons" may present their views; and it further provides that "[t]o the extent, if any, that the Director determines the collection of information by the agency is unnecessary, for any reason, the agency may not engage in the collection of the information."

In light of these provisions it is readily apparent that if the Federal Reports Act were construed to apply to the Commission's compulsory process issued for law enforcement purposes, the Commission's independence and effectiveness as a law enforcement investigative agency would be significantly diminished. It would not only provide members of an industry under investigation for possible violations of the Federal Trade Commission Act with a means to delay responding to the Commission's compulsory process by appealing to the Office of Management and Budget, but it would also provide that Office with a veto power not simply as to the form in which the Commission may collect information but indeed as to whether the Commission could collect the information at all.

Such intrusions on the Commission's investigatory and law enforcement powers would clash directly with congressional intent as expressed in the Federal Trade

Commission Act which vests the Commission with extensive compulsory process powers. Sections 6(a) and 6(b) of the Federal Trade Commission Act, 15 U.S.C. § 46(a), (b), give the Commission authority to conduct investigations by means of special reports, and Section 9 of the Act, 15 U.S.C. § 49, gives the Commission authority to issue subpoenas requiring the appearance of witnesses and/or the production of documentary evidence.

The importance of such compulsory process powers of investigation to the Federal Trade Commission's exercise of its law enforcement function was emphasized by the Supreme Court in *United States* v. *Morton Salt Co.*, 338 U.S. 632, 642-43 (1943). However, if the Federal Reports Act were construed to apply to the Commission's compulsory process issued for law enforcement purposes, the Office of Management and Budget would have, as the Commission stated in its Opinion on Jersey Standard's motion to quash (Petition, Exhibit 3, p. 19), "plenary, unappealable power to determine whether compulsory process 'is necessary' for proper effectuation of the Commission law enforcement, investigatory functions."

If Congress had intended by passage of the Federal Reports Act to abrogate these powers previously granted to the Federal Trade Commission, it would have clearly manifested its intention to do so. No such intention is found in the Act itself or in its legislative history. Indeed, the legislative history supports the plain and express provision of the statute to the effect that the Act applies only to information to be used "for statistical compilations of general public interest."

The report of the Senate Committee on Education and Labor [39] on the bill which ultimately was enacted as the Federal Reports Act [40] makes it clear that Congress' essential concern was to reduce the large number and duplication of statistical reports then being required from business and industry by the various Federal agencies.[41] The Committee pointed out the conclusions contained in a report of the Central Statistical Board [42] which was a response to a request from the President [43] asking the Board to report "'on the statistical work of the Federal agencies, with recommendations looking forward to consolidations and changes which are consistent with efficiency and economy, both to the Government and to private industry." [44] The conclusions of the Board, cited by the Committee, were as follows: [45]

> (1) the officials of practically all administrative agencies of the Federal Government recognize *the tremendous increase and duplication of statistical reports required from business and industry;*
>
> (2) that they are opposed to a central statistical agency for the collection of all information and reports; but that (3) *they are sympathetic to, and many recommend, a coordinating agency such as the Division of Statistical Standards in the Bureau of the Budget*, with sufficient authority placed in the Director of the Bureau of the Budget to require the releasing of information by one Federal agency to another and to reduce the demands for information made by the Government upon business enterprises. [Emphasis supplied.]

The Senate Committee report also refers to a report of the Senate Special Committee to Study Problems of American Small Business.[46] This latter report resulted from an extensive investigation and numerous conferences with the heads of Federal agencies, including the Director of the Bureau of the Budget, concerning the problem of reports required by the Government. The Small Business Committee's report, after noting that the proposed Federal Reports Act had originated with a letter from the President to the heads of agencies most concerned with reports to the Government, made the following observations.[47]

> These replies [received from the heads of the Federal agencies most concerned] by Mr. McIntire [Secretary to the President] *almost unanimously rejected the idea of a consolidation of Federal statistical work into one agency.* On the other hand, they just as unanimously advocated the establishing by law or otherwise of an agency to coordinate Federal Reporting services and eliminate duplications and costs.
>
> *The proposed bill to bring this coordination about* has been developed out of a number of conferences between representatives of the Senate Committee

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[39] S. Rep. No. 1651, 77th Cong., 2d Sess. (1942).

[40] S. 1666, 77th Cong., 2d Sess. (1942).

[41] S. Rep. No. 1651, 77th Cong., 2d Sess. 3 (1942).

[42] This Report is summarized in S. Rep. No. 479, Part 1, 77th Cong., 1st Sess. (1941), Report of the Special Committee to Study Problems of American Small Business entitled "Small Business Problems."

[43] Letter from President Roosevelt to the Chairman, Central Statistical Board, May 16, 1938, in S. Rep. No. 479, Part 1, 77th Cong., 1st Sess. (1941).

[44] *Id.* at 21–22.

[45] S. Rep. No. 1651, 77th Cong., 2d Sess. 3 (1942).

[46] S. Rep. No. 479, 77th Cong., 1st Sess. (1941).

[47] *Id.* at 1–2.

> to Study Problems of American Small Business and the Bureau of the Budget.
>
> * * * * * * *
>
> * * * [T]here is made a part of this report * * * data as evidence *that the President and the heads of the various Federal agencies almost unanimously advocate a means of coordinating Federal statistical reporting services and the vesting of power in a central agency to bring about this coordination to the fullest extent short of the central coordinating agency unsurping the authority to collect statistical data itself.* [Emphasis supplied.]

In addition to the reports discussed above, the Congressional debate also demonstrate that the Act was meant to apply only to information collected for statistical compilations. Nowhere in the debates is compulsory process issued for law enforcement purposes noted as subject to the clearance requirement of the Federal Reports Act. In sharp contrast the debates frequently refer to, and demonstrate Congressional concern with, the numerous statistical reports required by the War Production Board and the Office of Price Administration in connection with the war effort.[48]

The Commission's position that its investigational subpoenas and subpoenas issued during the course of litigation are not subject to clearance by the Office of Management and Budget under the provisions of the Federal Reports Act accords with the position of the Office of Management and Budget. See letter dated October 29, 1971, from the Clearance Officer of the Office of Management and Budget to the Federal Trade Commission to that effect (Petition, Exhibit 4).

CONCLUSION

Wherefore, it is respectfully submitted that the requirements of the Commission's subpoena are valid and proper, that enforcement of the subpoena is necessary and proper to enable the Commission to discharge its duties under the laws which it administers, that Standard-California's objections are without merit and therefore that the Court should issue the order prayed for in the Petition.

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In the United States District Court
for the District of Columbia
Civil Action No.———

Federal Trade Commission, 6th and Pennsylvania Avenue, NW., Washington, D.C. 20580, petitioner

v.

O. N. Miller, Chairman, and Standard Oil Company of California, a corporation, 225 Bush Street, San Francisco, California 94120, respondents

ORDER TO SHOW CAUSE

Pursuant to the authority conferred by Section 9 of the Federal Trade Commission Act, 15 U.S.C. § 49, petitioner, the Federal Trade Commission, having invoked the aid of this Court for an order requiring respondent Standard Oil Company of California, a corporation, by respondent O. N. Miller, Chairman of the Board of said corporation, to appear, testify and produce documentary evidence as required by a subpoena *duces tecum* issued by the Federal Trade Commission on November 24, 1971, in an investigation being conducted by the Commission under File No. 711 0042, and the Court having considered the Petition and the papers filed in support thereof, it is hereby

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[48] *See, e.g.,* 88 Cong. Rec. 9078, 9158, 9435–36 (1942) (remarks of Senator Vandenberg and Representatives Whittington, Smith and Hoffman). *See also,* 88 Cong. Rec. 9161, 9164, 9165, 9343, 9437–38.

Ordered that respondents Standard Oil Company of California and O. N. Miller, Chairman of the Board of said corporation, appear on the____day of __________ 1973, at 10 a.m. before the Honorable ____________, Judge of this Court, Room Number______, United States Courthouse, Third and Constitution Avenue, N.W., Washington, D.C., provided service is made on or before the____ day of__________ 1973, and show cause, if any there be, why this Court should not grant said Petition and enter an order directing the appearance, the giving of testimony and the production of books, records and documents as required by said subpoena; and it is

Further ordered that a certified copy of this order, and copies of said Petition and the memorandum in support thereof, filed herein, be served forthwith upon respondents by the United States Marshal in the manner provided in the Federal Rules of Civil Procedure for the service of summons; and it is

Further ordered that if respondents intend to file papers in opposition to said Petition or the entry of the order requested therein, such papers must be filed and served no later than ten days prior to the date on which respondents are to appear in this Court in compliance with this Order.

In the United States District Court for the District of Columbia

Civil Action No. ———

Federal Trade Commission, 6th Street and Pennsylvania Avenue, NW., Washington, D.C. 20580, pettioner

v.

O. N. Miller, Chairman, and Standard Oil Company of California, a Corporation, 225 Bush Street, San Francisco, California 94120, respondents

ORDER

Petitioner, the Federal Trade Commission, having invoked the aid of this Court, pursuant to 15 U.S.C. § 49, in requiring Standard Oil Company of California, by respondent O. N. Miller, to comply with an administrative subpoena *duces tecum* issued by petitioner in an investigation being conducted by petitioner (FTC File No. 711 0042) and the Court having considered the verified Petition and other papers of record, and the Court being of the opinion that the relief sought by petitioner should be granted, it is hereby

Ordered that respondent Standard Oil Company of California, by respondent O. N. Miller be, and hereby is, commanded to appear before a duly designated representative of petitioner at a time and place in Washington, D.C., to be designated by petitioner upon not less than five (5) days notice, and then and there to testify and produce the books, papers and documents requested in the subpoena *duces tecum* issued by the Commission on November 24, 1971, a copy of which is attached to the aforesaid Petition as Exhibit 1.

It is further ordered that a certified copy of this Order be served forthwith upon respondents O. N. Miller and Standard Oil Company of California by the United States Marshal.

Federal Power Commission,
Washington, D.C., July 21, 1971.

Memorandum to: General Counsel.
From: Assistant to the General Counsel.
Subject: Analysis of Jack Anderson Articles of June 14, 15, 20, 23 and 26, 1971.

Articles making reference to the Commission appeared under the by-line of Jack Anderson on June 14, 15, 20, 23 and 26, 1971 in his syndicated column entitled "The Washington Merry-Go-Round," which is published by the *Washington Post* and other newspapers throughout the country. These articles purport to be based upon internal staff memoranda which apparently came into the possession of this columnist through the actions of employees acting in violation of the ethical conduct standards of the Federal Power Commission (18 CFR § 3.5735–6). The Commission, by order of July 2, 1971, found that these articles may be *ex parte*, off-the-record commissions by an interceder and an attempt to prejudice the public interest and persons involved in the Southern Louisiana Area Rate Proceedings, Docket Nos. AR61–2, *et al.*, AR69–1. Since such communications would be within the prohibitions of Section 1.4(d) of the Commission's Rules of Practice and Procedure (18 CFR 1.4(d)), the Commission ordered them placed in the public files associated with these proceedings, but separate from the record material upon which the Commission can rely in reaching decisions. By the same order, the Commission found that the public interest required that it waive its right, under the Freedom of Information Act, 5 U.S.C. 552(d)(5), to maintain the confidentiality of the intra-agency memoranda referred to in these Jack Anderson articles and authorized the Secretary to designate such intra-agency meroranda which he can identify from the Anderson articles, including those related thereto, and to place them in the public files associated with the Southern Louisiana Area Rate Proceedings. Pursuant to this delegated authority, on July 2, 1971 the Secretary designated by a Release of Intra-agency Documents (hereinafter "Release") thirty-three intra-agency memoranda to be placed in the public file in the Southern Louisiana Area Rate Proceedings.

The articles appearing in Jack Anderson's columns of June 14, 15 and 20, 1971 primarily attack the reliability of the estimates of proved U.S. natural gas reserves which have been made annually since 1945 by the Committee on Natural Gas Reserves of the American Gas Association. These natural gas reserves estimates, together with those of Canada and estimates of oil and natural gas liquids reserves of the United States and Canada, are published jointly by the American Petroleum Institute, the Canadian Petroleum Association and the AGA in an annual report entitled *Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas in the United States and Canada*. In his articles, Jack Anderson refers to these estimates as "producers' figures" and states that the American Gas Association "speaks for the producers." According to testimony at transcript page 1413 of the Southern Louisiana Area Rate Proceeding by John C. Jacobs, Jr., the Chairman of the AGA Committee on Natural Gas Reserves, the AGA had 389 voting members as of April 15, 1970, made up of 345 domestic distribution companies, 31 domestic pipeline companies and 13 foreign distribution companies. In addition, he testified that there are 683 non-voting associate members made up of 606 manufacturing companies, 55 consulting organizations, 17 producing companies, and 5 financial organizations. Mr. Jacobs further testified at transcript page 1419 that of the 14 members of the AGA Committee on Natural Gas Reserves as of December 31, 1969, six work for pipeline companies, four work for producing companies, two work for distribution companies, one works for an agency of the United States Government, and one is Secretary of the AGA. Mr. Jacobs also outlined the general procedure by which the reserve estimate for each geographical district is prepared (tr. pp. 1421–22). His testimony indicated that the subcommittee member uses all available date which he deems reliable, from both public and private sources, in preparing reserves estimates for the fields assigned to him. These individual estimates are then subject to review and discussion by the full subcommittee before it adopts a reserve figure for each field within its geographical district. This testimony indicates that Jack Anderson erroneously asserted that the AGA "speaks for the producers" and that its reserves estimates are "producers' figures," although basic data comes from producers.

The June 15 article by Jack Anderson maintains that "the FPC's chief economist, Haskell Wald, found the industry's figures to be dubious." To support his proposition, Anderson cites and quotes fragments of or paraphrases memoranda from Haskell Wald dated February 12, February 19, November 13, and December 1, 1970. These memoranda are included intact as Exhibits A, C, R, and U, respectively, of the Secretary's Release.

The February 12 memo from Wald makes "a quick check of the consistency of the reserves data reported to FPC on Form 15 and the reserves data published by AGA." His results are summarized as follows:

The trends of the two series over the 1963–68 period are broadly similar, in that they both advance year-by-year until 1968 when they both declined. The annual changes, however, can hardly be said to match each other * * *

By quoting the past portion of the second sentence out of its proper context, Anderson distorts the comparison to give the appearance Wald is warning that the two series are contradictory. Reviewing the entire statement, it becomes evident that while Wald found divergence in the annual changes of the two series, he recognized that the trends are broadly similar. This is consistent with prior statements by Chairman Nassikas and the Commission's finding at page 23 of Opinion No. 598, issued July 16, 1971 in the Southern Louisiana Area Rate Proceedings, that "AGA and Form 15 data show similar trends of reserves and reserve-to-production (R/P) ratios."

Wald continued his comparison on page two:

> There is of course no reason why the two annual series should always move together or maintain a constant relationship to each other, since the interstate pipelines may succeed in contracting for a very high proportion of new reserve additions (or uncommitted reserves) in one year and a low proportion in another year.

By juxtaposing fragmented quotes from Wald's February 12 memo with his own conclusion, i.e., "The industry's estimates which should be consistent," Anderson created the illusion that Wald wrote that the two series should be consistent, Actually, Wald stated exactly the opposite at the bottom of the first page of his February 12 memo:

> The differences noted above may be entirely consistent with 100 percent accuracy in the two series, since the series measure different quantities.

The Wald memo of February 19 was a submission to the General Counsel of a list of questions for discussion with the AGA Committee on Natural Gas Reserves. Anderson states that in this memo Wald "called attention to an industry error of 1.3 trillion cubic feet." Wald's reference was to a memo from Dr. Khazzoom which "calls attention to a large reporting error in the reserves data for 1967." Khazzoom's memo of February 16, 1970 (Exhibit D of Release) referred to a computational error in the 1967 reserves for Texas R.R. Commission District 10 which he wrote "resulted in an overstatement of reserves in that district by .65 billion Mcf. When it was discovered in 1968 it was subtracted from the 1968 revisions." Khazzoom contended that "as a result, a comparison of '68 with '67 shows an erroneous drop in reserves of 1.3 billion Mcf (double the .65 billion Mcf error)." This subject was raised in a letter of June 20, 1969 from Lee C. White, then Chairman of the FPC, to Ed Parkes, then Chairman of the AGA Committee on Natural Gas Reserves (attachment 1) inquiring into the principal factors necessitating the downward revision of the reserves in this district (question 3b). Mr. Parkers responded in a letter of July 11, 1969 (attachment 2) as follows:

> This seems to be one time that a computer or its input erred. In computing the reserve in one field for the 1967 report, the 1967 production for that field was not subtracted. This made the 1967 reserve some 650 billion too high. This error was not discovered until 1968, when it was corrected. The correction resulted in the downward revision in 1968.

Evidence of this revision was included in the Southern Louisiana Area Rate Proceeding in Exhibit No. 46 by Dr. J. Daniel Khazzoom in September 1970.

Since the subtraction of production figures for this field were delayed by one year, the 1967 reserves figures were overestimated by .65 trillion cubic feet. However, the downward revision by that amount in 1968 should have resulted in that year's figures being neither overestimated nor underestimated. This would indicate to me a total error of only .65 trillion, which Khazzoom and Wald interpreted as 1.3 trillion. In any event, the deferral in reporting the production figures was corrected in 1968 and the FPC was aware of all of the facts by July 1969. Furthermore, since reserves were overstated by .65 trillion (or even 1.3 trillion) cubic feet in 1967, the producers would not have been the beneficiaries of this type of error.

Anderson's June 15 column states that on November 13, 1970 "Wald jolted Nassikas with another memo disclosing that the FPC's studies and the industry's figures were out of kilter by a startling 42 per cent." This apparently is the same memo which led Anderson, in his June 14 article, to compare AGA estimates of 24 trillion cubic feet in proved reserves in offshore Southern Louisiana with a 34 trillion figure which he stated "the FPC's own experts, after careful calculation, came up with."

In his June 20 article, Anderson asserts that "we have reported how the Federal Power Commission, under the prod of Chairman John Nassikas, has suppressed its own figures." Wald's November 13 memo makes absolutely clear that these figures were not withheld from the public by stating, "The figures cited above are in the public record." The 34 trillion cubic foot figure was taken from an estimate by a Commission staff witness placed in evidence as Exhibit No. 31A in the Southern Louisiana Area Rate Proceeding. As is explained in a memo to the Chairman from the Chief, Bureau of Natural Gas dated November 19, 1970 (Exhibit S of Release), differences in methods of allocation account for 2.1 trillion of the 10 trillion cubic feet difference in the two estimates and "the remaining difference can most probably be accounted for by the use, by AGA and pipeline companies, of different methods of estimating reserves in relatively wildcat or undeveloped areas such as the Offshore Federal Domain." Exhibit V of the Release is a joint memo dated December 16, 1970 to the Chairman signed by the General Counsel; Chief, Bureau of Natural Gas; and Haskell Wald as Chief of the Office of Economics comparing these two reserve estimates.

Anderson in his June 15 article refers to a "strong memo" from Wald to Gooch's Office of December 1, 1970 "reiterating that the evidence indicated errors up to 40 per cent in some of the industry data." This memo (Exhibit U of Release) was a note to me requesting that two separate comments be added to the joint memo, then in draft stage, after Wald's signature. The first comment was to read as follows:

1. A 40 percent allowance for judgmental factors may be appropriate for new fields without production experience, but not for fields which have been in production for a few years. Much of the offshore reserves is in the latter category.

Although this in no way relates to the disingenuous conclusion Anderson drew that "evidence indicated errors up to 40 per cent in some of the industry data," even this proposed comment did not appear in the final joint memo of December 16, signed by Wald, which stated:

Staff geologists believe that a difference of 20 percent, plus or minus, appearing in the estimates of two geologists would not establish either estimate as being unreasonable. Thus a total range of 40 percent could be allowed and might even be conservative in a relatively undeveloped area such as the Federal Domain.

Referring to Wald's December 1 memo again in his June 20 article, Anderson stated:

The figures provided by the American Gas Association, representing the producers, might be helpful on broad trends, Wald suggested tactfully. But the industry figures were highly questionable, he cautioned, for assessing the need for a rate increase.

Wald's actual language in his proposed comment on December 1 to the draft of the joint memo was:

2. I agree with the statement about corroboration of broad trends. However, the reliability of the AGA data for estimating unit costs or assessing the adequacy of current supply is a separate issue—and a critical issue for the Commission's area rate decisions.

Mr. Wald comments on Anderson's June 20 column in a memo to Chairman Nassikas dated June 21, 1971 (attachment 3) wherein he states:

The purpose of my comment to Mr. Wakefield was to make clear my position that the reliability of the AGA data is unproven except as an indicator of broad trends. I did not go so far as to suggest that my reservations about the accuracy of the data provided a basis for questioning the need for a rate increase.

As you know from my previous comments on the Anderson columns this Office has been on record favoring a rate increase since the spring of 1969. The latter fact belies most of Anderson's talk about consumers being "bilked" because the Staff Brief ignores my warnings about inconsistencies between the Form 15 and AGA reserves data.

The draft was revised to meet Wald's invitation of December 1 to make "the appropriate changes in the memorandum to accommodate my comments, so that I might sign without reservations." The final, joint memo of December 16, reached the following conclusion on page 2:

"The Commission has made use of AGA published estimates for additions to reserves and production volumes in determining certain unit cost components when setting area rates. The determination of the figures to be used for additions to reserves is based on trends ranging from five to fifteen years. The estimate of additions for any particular year, therefore, is significant only insofar as it may affect the long-term trend of reserves added. Since the cost components involved are calculated from annual additions to reserves, the estimate of total proved reserves at a point in time would not be a factor in the cost computations which have been used in setting area rates. The figures introduced in AR69–1 in Staff Exhibit No. 31–A do not in any way influence our opinion that the Commission may reasonably rely upon the AGA reserve figures."

Since it is the averaged additions to reserves rather than the total proved reserves at year-end which are used in cost computations, even were it true that the producers "have greatly understated the amount of natural gas available under the Louisiana bed," it would not follow, as Anderson declared in his June 14 article, that "their figures make the risk and expense of sinking new wells appear to be far higher than is true."

For further reply to Jack Anderson's allegations of deception regarding AGA reserves data, Haskell Wald's memorandum of June 17, 1971 (attachment 4) to the Chairman explains how Anderson misused information in Wald's memoranda and ignored material statements therein:

4. The Anderson column also refers to our memorandum of November 13, 1970, concerning the difference of 42 percent between BNG and AGA estimates of reserves in the Federal domain offshore Louisiana. The basic data are taken from exhibits in the AR69-1 proceeding. Mr. Joyce's memorandum of November 19, 1970, explains that the discrepancy of 10 billion Mcf, or 42 percent, can be attributed in part to diferent methods of allocating the reserves in fields which straddle the area boundary and in part to diferent estimating procedures for reserves in relatively undeveloped fields. Our memorandum concludes that "our Form 15 reports are useful for verifying the broad trends reported by AGA but not the reserves reported in particular producing areas." This conclusion is ignored by Mr. Anderson.

5. Finally, the Anderson column mentions "a strong memo to Gooch's office on December 1 reiterating that the evidence indicated errors up to 40 percent in some of the industry data." This is another example of Mr. Anderson's misuse of information. The actual language of my memorandum, reproduced below, is not critical of industry data:

"1. A 40 percent allowance for judgmental factors may be appropriate for new fields without production experience, but not for fields which have been in production for a few years. Much of the offshore reserves is in the latter category."

Furthermore, the memorandum continues as follows:

2. I agree with the statement about corroboration of broad trends.

"The latter statement is also ignored by Mr. Anderson."

In his June 15 article, Anderson wrote that on February 13, 1970, Chairman Nassikas received another personal memo from Edward McManus, chief of the Producer Division of the Commission's Bureau of Natural Gas, "who warned that 'the reliability of gas reserve estimates (by the industry) for any specific reservoir of field initially is suspect.' " A perusal of the actual memo from McManus, which is Exhibit B of the Secretary's Release, reveals that the parenthetical phrase was deceptively placed in the middle of the sentence by Anderson and has no relation to the meaning McManus was conveying. A memo from McManus to the Chairman dated June 16, 1971 (attachment 5) points out how Anderson's articles "consist of twisted paraphrasing and lifting out of context of my memorandum dated February 13, 1970." McManus concludes his June 16 memo as follows:

"True or factual reporting would have required the column to explain the basis of the statement 'the reliability of gas reserve estimates for any specific reservior or field initially is suspect,' as my memorandum does explain such basis. Further fair reporting would have required reference to the summary or conclusion of the memoranda that the AGA reserve studies as a yearly service is reliable as a statistical series indicating a signal as to status of the gas supply."

Anderson contends in his June 15 article that after receiving the February 1970 memoranda, "Nassikas and Gooch should have ordered an immediate, massive FPC staff investigation." The Commission's Order Enlarging Investigation and Proposed Rulemaking was issued December 15, 1969 in the Southern Louisiana Area Rate Proceeding (attachment 6). In that order, the Commission had expanded Docket No. AR69-1 and indicated that the first phase of the proceeding "should include evidence with respect to the adequacy of gas supply and adequacy of service to consumers, the demand for gas, the cause of a shortage, if any" and had called for evidence, in addition to the supply and demand evidence, which would include "producer data as to volumes of reserves in the offshore area not contracted to interstate pipelines and data on status of shut-in gas wells." Thereafter, on March 17, 1970 in the same proceedings, the Commission issued its Order Requiring Reporting of Specified Reserves Data and Prescribing Procedure (attachment 7). Under this order the Commission found that "the public interest requires that the volumes of proved natural gas reserves held by producers in the Southern Louisiana area and not contracted to interstate pipelines be reported and made available in this proceeding in the form and manner hereinafter prescribed." The order also provided that the individual producers making such reports shall make any workpapers or other underlying data available to the Commission's staff for purposes of a confidential audit.

In his June 15 article, Anderson again quotes a fragment of a sentence in an attempt to distort its true meaning. He attacks a letter of September 15, 1970 from Chairman Nassikas to Senator Philip Hart by stating that the Chairman "said the two crucial sets of data 'closely parallel' each other." The Chairman's actual sentence in that letter (attachment 8) reads, "The FPC has been collecting this data on Form 15 annually since 1963 and finds that they closely parallel trends and projections based on national statistics." When read in its entirety, it is clearly consistent with Wald's February 12 memo which stated that "the trends of the two series over the 1963–1968 period are broadly similar." After quoting the Chairman's statement that "The staff has also made specialized reports and conducted investigations," Anderson concludes that "This made it appear that the staff backed up the gas industry's figures when, in fact, the staff memos said exactly the opposite." The Chairman's letter at this point was using as an example the 'FPC Staff Report on National Gas Supply and Demand" and was in no way making reference to investigations of gas industry figures. Thus Anderson's statement is doubly misleading in that neither was the Chairman attempting to make "it appear that the staff backed up the gas industry's figures" nor did "the staff memos" say "exactly the opposite."

Anderson's June 15 article also states that on December 9, 1970 at a Senate hearing chaired by Senator Lee Metcalf "Gooch testified that the industry's figures were 'reasonably reliable.'" A review of the transcript at pp. 356–57 of those hearings (Senate Committee on Government Operations, Subcommittee on Intergovernmental Relations) shows that Gooch's testimony was actually a quotation taken from the response of the FPC staff in Docket R–389A which included the statement that "Staff concludes that AGA data are reasonably reliable."

The articles by Jack Anderson contain a number of statements which imply that Chairman Nassikas, having received memoranda from two staff members on a particular point, should have accepted their statements (or Anderson's interpretations of them) unquestioningly. Even though a reading of the memoranda themselves, along with contemporaneous memoranda, clearly shows that their contents have been misinterpreted or misrepresented to the public by Anderson, the implication that the Chairman was not at liberty to follow the dictates of his own judgment in accepting or rejecting any or all such memoranda is astonishing. The United States Court of Appeals for the Second Circuit, in the recent case of *International Paper Company* v. *Federal Power Commission*, 438 F.2d 1349 (1971), spoke to this very point in upholding the District Court's refusal to order the Commission to disclose all internal staff memoranda transmitted to it. At pages 1358–59, that Court stated the following:

> We agree with this finding, because the views of individual members of the Commission's staff are not legally germane, either individually or collectively to the actual making of final orders. They could be grossly misleading, when applied to the ultimate findings and conclusions reached by the FPC as a whole, because at best they are only advisory in character. To allow disclosure of these documents would interfere with two important policy considerations on which § 552(b)(5) is based: encouraging full and candid intra-agency discussion and shielding from disclosure the mental processes of executive and administrative officers. ***

The article of June 23 by Jack Anderson states that "the case for raising rates was made by Nassikas's general counsel, Gordon Gooch, who drafted a lengthy legal brief justifying the gigantic hornswoggle." The staff's initial brief, signed by Richard V. Mattingly, Jr., and Roy A. Nierenberg, Commission staff counsel, was filed on April 15, 1971 (attachment 9). The staff reply brief, signed by the same staff counsel, was dated May 6, 1971 (attachment 10). Anderson contends in his June 23 article that "The Office of Economics took vigorous exception to Gooch's figures, facts and arguments. Not only were ringing dissents made, but the economists demanded that their disagreement be written into the brief." Anderson asserts that this "demand" was made in a May 14, 1971 memo (Exhibit GG of the Secretary's Release). This memo from David Schwartz, Assistant Chief, Office of Economics, who was supervising that office's participation in the Southern Louisiana Area Rate Proceeding, transmits Alternatives A, B and C as proposed errata to the staff brief. Alternatives A and B proposed errata to the reply brief, whereas Alternative C proposed a lengthy errata to the initial staff brief. David Schwartz had, six weeks previously, submitted

6 pages of comments on the initial staff brief to the Commission staff counsel (Exhibit Z of Release). By his May 14 submittal, one month after the filing of that initial brief, Schwartz raised entirely new and heretofore unmentioned objections and exceptions to that brief. To have permitted a wide variety of changes in the staff's *initial* brief after all parties had submitted their *reply* briefs would have raised the possibility of cogent objection by other partes that their right to file reply briefs had been made ineffective.

Anderson contends that after these alternatives were submitted, "Gooch buried the memo deep in his files and submitted his brief to the commissioners with no hint that the FPC's best economist had raised a howl." Contrary to this accusations, on May 14, 1971 an Errata to Staff Reply Brief (attachment 11) was filed and served on all parties, encompassing Alternative B of the Schwartz proposal and noting the dissent of the Office of Economics. Although this errata disassociated the Office of Economics from the views expressed in the brief dealing with the reliability of cost estimates and new gas well gas cost issues, the Office of Economics raised no exception to the following statement at page 3 of the Staff Reply Brief:

> The AGA reserves statistics are unquestionably reliable, and provide an accurate measure of the proved reserves inventories of the individual supply areas and of the nation.

For additional clarification, Haskell Wald wrote a memo to the Chairman dated June 23, 1971, commenting upon Jack Anderson's column of June 23, 1971 (attachment 12) in which he points out, again, that Anderson has misrepresented and grossly distorted the Office of Economics position. A portion of that memo reads as follows:

> Turning to the specific issues covered in the Anderson column, I believe that my own position, which largely contradicts what Anderson reports, is fully explained in my previous memoranda to you on the first three Anderson columns. I have not dissented from the Staff position that the FPC 'field audit served to verify the accuracy of the uncommitted reserves volumes as initially reported' (see page 10 of Staff Initial Brief). Anderson grossly distorts this statement when he substitutes 'industry figures on natural gas reserves' for 'uncommitted reserves volumes as initially reported.' I have no objection to the statement, in Anderson's column, that the rate increase would 'make drilling for gas . . . more attractive,' nor to the statements that uncommitted reserves are 'extremely small' and that rate increases 'are necessary.'

The background to the issuance of the errata notice is set forth in a memo of June 23, 1971 from the General Counsel to the Chairman (attachment 13). This memo points out that the dispute as to the briefs arose between the Office of Economics and the Bureau of Natural Gas over whether the econometric model presented by OEC was the only reliable evidence in the proceeding. Rather than rejecting the OEC model when reaching its decision in Opinion 598, the Commission accepted it in large measure in paragraph 89 at page 38.

The Anderson article of June 26 claims that "FPC officials set up an illegal, secret meeting with an industry spokesman only weeks before his case was to be heard." As Exhibit E of the Release shows, Thomas Joyce had scheduled a meeting with John Jacobs, Chairman of the AGA Committee on Natural Gas Reserves, to be held on April 2, 1970. Neither Jacobs nor the AGA were parties to the Southern Louisiana proceeding, although Jacobs was to appear as a witness for the United Distribution Companies. The memo of March 11, 1970 (Exhibit F of Release) from Haskell Wald indicates that although he would be "out of the city on the meeting date," he did intend to have two members of the Office of Economics present. By memo of March 12, 1970 (Exhibit G of Release) the General Counsel suggested that Commissioners and their personal staff refrain from attending since Jacobs was to be a witness in AR69–1. On March 16, 1970 18, 1970. Mr. Gooch and Mr. Wald exchanged memos on the approach being taken in asking the witness prior questions (Exhibits K and L of Release). On March 18, 1970, Mr. Gooch and Mr. Wald exchanged memos in the approach being taken in asking the witness prior questions (Exhibit K and L of Release). On March 19, 1970, Mr. Wald wrote a memo to the General Counsel entitled "Miscellaneous Observations on Arrangements for AGA Witness on Reserves Estimates" (Exhibit M of Release) in which he stated:

> 6. I am concerned that we may be exaggerating the importance of the AGA reserves estimates. It is true that these estimates are crucial for the new gas costing, but they are not crucial for the end result. As you may know, I do not have any faith in the costing methodology and the resultant estimates. I believe

that the most valuable source of information on the current gas supply situation lies in the experience of gas procurement personnel of pipeline companies. Are we confident that the pipeline companies will provide adequate testimony on their efforts to purchase new supplies and on the state of the gas supply market as they see it? Is there anything we can do in advance to make certain that the pipeline company witnesses will cover the subject in depth?

On March 23, 1970, Wald addressed another memo to the General Counsel on the subject "Propriety of Pre-Hearing Off-the-Record Meeting with AGA Witness in AR69–1" (Exhibit N of Release). This is the memo which Anderson contends "is worth quoting at length for it shows more vividly than any of the Nassikas papers the Byzantine world of the FPC, where pro-consumer and pro-industry factions are locked in combat." At page 2 in a footnote, Wald expressed his legal opinion that attendance at the April 2 meeting by bureau or office chiefs (or their deputies) "would appear to violate the Commission's rule on ex parte communications." Section 1.4(d) of the Commission's Rules of Practice and Procedure (18 CFR 1.4(d)) reads, in pertinent part, as follows:

> (d) *Ex parte communications.* In order to avoid all possibilities of prejudice, real or apparent, to the public interest and persons involved in proceedings pending before the Commission——
>
> (1) No person who is a party to, or his counsel, agent, or other person acting on his behalf, and no interceder in, any on-the-record proceedings, shall submit ex parte, off-the-record communications to any member of the Commission or of his personal staff, to the hearing examiner, or to any employee participating in the decision in such proceeding, regarding any matter at issue in any contested on-the-record proceeding, except as authorized by law: and no Commissioner, member of his personal staff, hearing examiner, or any employee participating in the decision in such proceeding, shall request or entertain any such ex parte, off-the-record communications.

Anderson was even stronger in his legal analysis of the Commission's Rules when he wrote:

> FPC rules clearly state that no staffer can meet of-the-record with a potential witness who is directly involved in a disputed case. This rule is designed to prevent the FPC from giving away its case or making any deals with the potent industries it is supposed to regulate.

There is no rule at the FPC which prohibits members of the staff from consulting with actual or potential non-staff witnesses in a proceeding unless such consultation would not conform to the standards of ethical conduct required of practitioners before the Courts of the United States. Such conduct is required of all persons appearing before the Commission or the presiding officer by § 1.4(a)(3) of the Comission's Rules of Practice and Procedure (18 CFR 1.4(a)(3)). The Commission, through its staff, has the affirmative obligation to inquire into and obtain all relevant facts in cases before it; see *e.g., Scenic Hudson Preservation Conference* v. *F.P.C.*, 354 F.2d 208, *cert. denied* 384 U.S. 941 (1965). There is nothing improper in securing non-staff testimony. The *ex parte* rule, on the other hand, prohibits attempts by outsiders to communicate with the Commission and certain other designated employees in an effort to influence the decision of the Commission or the hearing examiner in a pending case. This distinction was set out in the memo of March 25, 1970, from the General Counsel to Wald (Exhibit O of Release).

Those who read the Anderson articles may be mislead into believing that the only function of the Commission's General Counsel is to advise the Commission itself on pending decisions. Such is not the case. The General Counsel has a dual role, as set forth in the job description for that position, (attachment 15) approved by the Civil Service Commission on September 20, 1960. In addition to advising the Commission, the General Counsel is responsible for the Office of General Counsel, which provides staff counsel in all Commission hearings. As the job description states, the General Counsel is "responsible for planning, organizing, directing, and executing the work of the Office of General Counsel . . . [which] . . . involves the preparation, trial, and argument of all the Commission's cases before hearing examiners, before the Commission and before State and Federal Courts . . . " This dual role of the General Counsel is in acordance with the Administrative Procedure Act, which does not require a separation of functions in proceedings "involving the validity or application of rates, facilities, or practices of public utilities or carriers." 5 U.S.C. § 554(d)(2)(B)

The dual role of the present General Counsel's predecessor was challenged in another type of case in *International Paper Co.* v. *F.P.C.*, 438 F.2d 1349 (CA2

1971). The Second Circuit there held that issue to be waived, and a petition for *certiorari* is pending before the Supreme Court.

In the memo of March 25, 1970 to Wald (Exhibit O of Release), the General Counsel responded that he found Wald's objections to be wholly frivolous, but that he nevertheless asked that the meeting be postponed for the sole reason that Wald objected. On March 27, 1970, the Chief of the Bureau of Natural Gas sent a memo cancelling the meeting (Exhibit P of Release).

An uninformed reader of the Anderson articles would likely conclude that the Commission's Office of Economics was opposed to any rate increase being granted to the natural gas producers. For example, in his June 14 article, Anderson states that "one of the FPC documents shows how the economic division had tried to persuade the FPC to uphold the consumers." In the June 23 article, Anderson states that the economists requested that their dissent be registered to a statement in the staff brief "that the rate increases are necessary." To clarify this misconception, two internal memoranda from Haskell Wald, Chief of the Office of Economics, which are addressed to this point, are attached. His memorandum of August 26, 1969 to the Commission (attachment 16) states that "a shortage of gas supply is unmistakable evidence that the prevailing prices are too low to maintain a supply-demand equilibrium." The recommendation is therein made that "we believe that a price increase in the neighborhood of 5 cents per Mcf could be justified."

Additional elucidation of the position taken by the Commission's Office of Economics is made in Haskell Wald's memorandum to Chairman Nassikas of June 16, 1971 entitled "Policy Position of Office of Economics on Area Rate Regulation" (attachment 17). Wald summarizes the position of his office as follows:

The Washington Merry-Go-Round columns by Jack Anderson on June 14 and 15—which we must asume to be based in part on pirated FPC staff memoranda—present an erroneous view of the differences between this Office and other parts of the Commission on the conduct of the area rate proceedings. By quoting statements out of context and misinterpreting the purpose of the internal memoranda, the columns wrongly imply that this Office has denied the existence of a gas shortage, has opposed higher rate ceilings, and has attempted to forestall Commission action to raise the ceilings.

In summary, this Office's disagreements with OGC and BNG in the area rate proceedings have focused on evidentiary issues, not on rate level recommendations, while the Office's objections to the course being followed by the Commission reflected our concern that the gas supply shortage was being aggravated by the delays associated with the continuance of area-by-area litigation in the *Permian* format. In our view, the objective of protecting consumers required prompt, 'once-and-for-all' nationwide rate increases to assure the future adequacy of gas supply. The Office's policy agenda rejected end-use control, except as a measure of last resort, and favored. instead more flexible use of the supply-eliciting incentive of higher rates to restore supply-demand balance. Two of the Commission's actions during the past year—namely, the R-389A rulemaking and the 'sanctity of contract' legislative proposal—have been key elements in the Office's policy program.

In summary, a dissection of these five articles appearing in the Jack Anderson columns discloses that not one charge or accusation is supportable, but that every direct allegation or innuendo is based upon misrepresentations, distortions, fragmented quotations, or phrases taken out of their proper context.

STEPHEN A. WAKEFIELD.

FEDERAL POWER COMMISSION,
Washington, D.C., July 29, 1971.

Hon. PHILIP A. HART,
Chairman, Subcommittee on Antitrust and Monopoy,
U.S. Senate,
Washington, D.C.

DEAR MR. CHAIRMAN: This will reply to your letter of July 23, 1971, concerning the release of intra-agency documents in the above-designated proceedings. In accordance with your request I am enclosing copies of the "Order Concerning Ex Parte Communication and Authorizing Release of Intra-Agency Documents" issued July 2, 1971; the "Release of Intra-Agency Documents" also issued July 2, 1971, together with copies of the released documents; and an example of the letter used by the Chairman and the General Counsel in responding to Congressional inquiries concerning the Jack Anderson columns.

In addition to the documents you have requested, I am also enclosing the Principal Statement of Chairman John N. Nassikas, Appendices A through K of the Principal Statement, the Summary Statement of Chairman Nassikas with the attachment of July 21, 1971, analyzing the Jack Anderson columns of July 14, 15, 20, 23 and 26, and the Statement of Commissioner Lawrence J. O'Connor, Jr., presented at the hearings before the Subcommittee on Special Small Business Problems, Select Committee on Small Business, of the House of Representatives, on July 22, 1971, pertaining to the subject matter of your inquiry.

If we can be of further assistance, please advise.

Very truly yours,

KENNETH F. PLUMB, *Secretary.*

FEDERAL POWER COMMISSION

Before Commissioners: John N. Nassikas, Chairman; Lawrence J. O'Connor, Jr.; John A. Carver, Jr.; Albert B. Brooke, Jr.; Pinkney Walker.

July 2, 1971.

Area Rate Proceeding (Southern Louisiana)
Docket Nos. AR61–2. *et al.* Docket No. AR69–1.

ORDER CONCERNING EX PARTE COMMUNICATIONS AND AUTHORIZING RELEASE OF INTRA-AGENCY DOCUMENTS

I

The Commission takes note of certain articles appearing in the *Washington Post* (and other newspapers, sometimes in different text) under the by-line of Jack Anderson on June 14, 15, 20, 23, 26, 1971. Each *Post* article, which is attached hereto as exhibits A, B, C, D, and E, respectively, may constitute an attempt to influence the Commission's decision in the consolidated proceedings which bear the docket numbers AR61–2; AR69–1, by off-the-record communications. This case was instituted by Commission order May 10, 1961 and will be decided on the basis of the hearing record and pursuant to the Natural Gas Act and the Administrative Procedure Act. The record in the case is presently before the Commission. All parties have been given an opportunity to file evidence and to cross-examine witnesses, to file briefs and reply briefs. By order of March 15, 1971, the Commission found that due and timely execution of its functions required the omission of the intermediate decision by the hearing examiner, pursuant to Section 1.30 of the Commission's Rules of Practice and Procedures (18 CFR 1.30), and the case is now pending before the Commission for decision. Since the Anderson articles, exhibits A to E of this order, may constitute ex parte communications within the prohibitions of Section 1.4(d) of the Commission's Rules of Practice and Procedure (18 CFR 1.4(d)), we have determined to apply subparagraph 2 of that Section:

> All written communications prohibited by subparagraph (1) of this paragraph shall be delivered to the Secretary of the Commission who should place the communications in the public files associated with the case, but separate from the record material upon which the Commission can rely in reaching a decision.

II

Exhibits A to E refer to intra-agency memoranda which, under the Freedom of Information Act. 5 U.S.C. Section 552(a)(5), are privileged. Under the exception to the Freedom of Information Act, the Commission is not required to release the memoranda. However, since this may be an attempt to prejudice or to influence the Commission's decisions in these proceedings, we find it to be in the public interest that the Commission's right to invoke this exception be waived on this occasion.

The Secretary, after consulting such other staff as he may deem necessary, is authorized to designate such intra-agency memoranda which he can identify from exhibits A to E of this order or related thereto which he will then place in the public files associated with this case.

The Commission finds:

1. Exhibits A to E consisting of articles appearing in the *Washington Post* and other newspapers on June 14, June 15, June 20, June 23, and June 26, 1971 may be ex parte, off-the-record communications by an interceder and an attempt to prejudice the public interest and persons involved in this proceeding, within the prohibitions of Section 1.4(d) of the Commission's Rules of Practice and Procedure.

2. The public interest under the circumstances of this case requires that the Commission waive its right, under the Freedom of Information Act, 5 U.S.C. Section 552(d)(5), to maintain the confidentiality of the intra-agency memoranda referred to in the above-mentioned articles by Jack Anderson, and certain related memoranda.

The Commission orders:

1. The following communications shall be delivered to the Secretary of the Commission who shall place the communications in public files associated with these proceedings, but separate from the record material upon which the Commission can rely in reaching decisions:

Exhibit A. The article by Jack Anderson appearing in the *Washington Post* on Monday, June 14, 1971.

Exhibit B. The article by Jack Anderson appearing in the *Washington Post* on Tuesday, June 15, 1971.

Exhibit C. The article by Jack Anderson appearing in the *Washington Post* on Sunday, June 20, 1971.

Exhibit D. The article by Jack Anderson appearing in the *Washington Post* on Wednesday, June 23, 1971.

Exhibit E. The article by Jack Anderson appearing in the *Washington Post* on Saturday, June 26, 1971.

2. The Secretary is authorized to place the intra-agency memoranda which he designates pursuant to Part II of this order in the public file in the consolidated proceedings which bear the docket numbers AR61-2; AR69-1.

By the Commission.

KENNETH F. PLUMB, *Secretary.*

Exhibit A

[From the Washington Post, June 14, 1971]

FPC CHIEF AND NATURAL-GAS RATE RISE

(*By Jack Anderson*)

Federal Power Commission Chairman John Nassikas, who is supposed to protect the housewives from excessive gas charges, is pushing instead to add a whopping $4 billion to their bills based on industry-supplied information that conflicts with a study by the commission staff.

He has gone so far as to fail to reveal certain evidence and to mislead senators about the basis of the $4 billion rate increase.

The evidence—in the form of studies, letters and memos—has been kept under lock by Nassikas. Nevertheless, we have obtained copies of these documents.

Squeezing $4 billion out of the housewives, of course, is a complex operation. But here are the facts as simply as we can present them:

The Federal Power Commission fixes the basic rates that millions of consumers pay for natural gas. The gas producers always want to raise the rates, naturally, to increase their profits. But the FPC was established to keep the public from being gouged.

The producers are now seeking a rate increase on the gas they will draw from a vast Louisiana reservoir. The higher rate, which would be tacked on to the monthly bill of every householder who uses the gas, is supposed to be an incentive to encourage the producers to sink more wells.

FIGURES DISPUTED

The producers, according to the FPC staff, have greatly understated the amount of natural gas available under the Louisiana bed. Their figures make the risk and expense of sinking new wells appear to be far higher than is true.

The American Gas Association, which speaks for the producers, estimated one part of the Louisiana reserves to be 24 trillion cubic feet. But the FPC's own experts, after careful calculation, came up with a 34 trillion figure. The difference of 10 trillion cubic feet would seriously weaken the producers' case for a rate increase.

Nassikas not only accepted the producers' figures but failed to reveal estimates that were damaging to the producers.

We know from copies of documents in our possession that the Federal Power Chairman was fully informed as early as February 1970, by both his Economics and Producers divisions that the industry's figures were suspect. Yet he failed to reveal the discrepancy and sided with the gas producers in public statements. Senate hearings and congressional correspondence.

The FPC's experts based their estimates, in part, upon figures furnished by the pipeline companies. These figures were far higher than those submitted by the gas producers. But Nassikas told Sen. Philip Hart (D-Mich.), the Senate antitrust chairman, that the gas reserve figures from the producers and pipeline operators "closely parallel" each other. Nassikas knew from his own economic study, dated Feb. 12, that the figures were "surprisingly wide apart."

One of the FPC documents shows how the economic division had tried to persuade the FPC to uphold the consumers. Failing this, an appeal was made to Nassikas's general counsel, Gordon Gooch, to amend the legal brief to show that the economics division had objected.

The economics office wrote a strong, detailed dissent. It not only was excluded from the legal brief but was put away in locked files. Thus, the economics experts were denied even the dignity of dissent.

Then, over the protests of consumer advocates, Nassikas took the $4 billion rate case away from a tough hearing examiner, Martin Rendelman. The American Public Gas Association, which fights for the consumers, tells us this move was unprecedented.

A formal ruling from the FPC is still pending. Only an outpouring of mail from the housewives can save them from $4 billion in extra gas payments.

In coming days, we will quote more fully from the FPC documents. We will also turn the documents over to appropriate congressional authorities for action.

Footnote: Nassikas refused to talk with us. Gordon Gooch, his chief counsel, explained Nassikas cannot comment because the case is still pending. Gooch himself spoke emphatically with us for an hour, denying any suppression or wrongdoing by Nassikas or other FPC officials.

WASHINGTON WHIRL

Phony Savings—The Office of Education has boasted in a house organ about reducing "the national debt by $169.45." This is the first royalty check from its program of copyrighting contract studies. What the office didn't mention is that it has spent tens of millions of tax dollars to pay for the studies, which will now be copyrighted. Not only does the contractor get a piece of the royalties, but he also collects greater profits from the original contracts.

Animal Cruelty—A dog peddler, who was caught nearly three months ago with 107 uncaged dogs and nine cats in his stuffy, unventilated truck, is still licensed by the Agriculture Department to ship animals across state lines. The department's Animal Health Division, which is charged with enforcing federal animal care laws, hasn't bothered to revoke the license of North Carolina dog dealer John G. Seward. This is typical, say insiders, on the department's lackadaisical enforcement.

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Exhibit B

[From the Washington Post, June 15, 1971]

FPC STAFF DISPUTED INDUSTRY DATA

(*By Jack Anderson*)

We have detailed how Federal Power Commission Chairman John Nassikas failed to reveal evidence and misled Congress on a proposed $4 billion rate increase for the natural gas producers.

This is a stupendous sum, which would be squeezed out of the customers in the form of higher monthly gas payments.

We have pieced together the story from a sheaf of memos and studies kept under lock at the FPC. Through a maze of intermediaries, however, we have obtained the papers.

It would take dozens of columns to publish them all, with their legal profundities and complexities. But here is the outline of our case against Nassikas.

The papers reveal that Nassikas ignored the studies of his own economists and relied upon the gas industry's information. The FPC, of course, is supposed to protect the public against the depredations of the gas barons. Yet Nassikas, speaking for the FPC, quoted industry figures to senators—figures that had been contradicted by the FPC's economists.

These figures had to do with the Louisiana gas reserves, which eventually will supply half the nation. The FPC's chief economist, Haskell Wald found the industry's figures to be dubious.

On Feb. 12, 1970, Wald wrote a personal memo to Nassiskas, warning that two crucial sets of industry data on gas reserves "can hardly be said to match each other."

He could see "no way of corroborating" some of the industry data. The FPC's own auditing, he said, "tells us nothing about the reliability" of the questionable information.

The industry's estimates, which should be consistent, show "surprising large differences" with many specific figures "surprisingly wide apart," he wrote.

The following day, Nassiskas received another personal memo from Edward McManus, chief of the FPC's producer division, who warned that "the reliability of gas reserve estimates (by the industry) for any specific reservoir or field initially is suspect."

On Feb. 19, Wald sent an even blunter memo to Gordon Gooch, whom Nassikas had picked to be the FPC's chief counsel.

"We are concerned over the apparent lack of adequate checks on the statistical reporting operations," wrote Wald. He called attention to an industry error of 1.3 trillion cubic feet.

At this point, Nassikas and Gooch should have ordered an immediate, massive FPC staff investigation. Instead, they accepted the gas producers' figures.

Senate Antitrust Chairman Philip Hart (D–Mich.) got wind of the matter. In a Sept. 1 letter, Hart asked Nassikas explicitly about the information furnished by the natural gas industry.

In Nassikas' reply, dated Sept. 15, he said the two crucial sets of data "closely parallel" each other. To buttress this statement, he added: "The staff has also made specialized reports and conducted investigations."

This made it appear that the staff backed up the gas industry's figures when, in fact, the staff memos said exactly the opposite.

On Nov. 12, Nassikas again cited the industry figures at a Senate hearing before the Senate Fuels Subcommittee.

Chairman Frank Moss (D–Utah) asked: "You do have to rely . . . on industry figures?"

"Yes, but not entirely," said Nassikas. Later, he added that "there is substantial reliance but . . . it is not nonanalytical reliance." In its context, the statement gave the impression that the FPC's "analytical" studies, supported the industry's figures. The opposite, of course, was true.

The next day, Wald jolted Nassikas with another memo disclosing that the FPC's studies and the industry's figures were out of kilter by a startling 42 per cent.

Wald followed this up with a strong memo to Gooch's office on Dec. 1 reiterating that the evidence indicated errors up to 40 per cent in some of the industry data.

Eight days later, both Nassikas and Gooch again used the industry's figures at a Senate hearing chaired by Sen. Lee Metcalf (D–Mont.), an expert on the subject. Gooch testified that the industry's figures were "reasonably reliable."

Footnote: As we previously reported, Nassikas refused to discuss the $4 billion increase with us on the grounds that the case is still before him. Gooch has denied any wrongdoings by Nassikas or himself.

Sen. Gaylord Nelson (D-Wis.) is introducing a bill this week to force outboard motor firms to install anti-pollution devices. The motors dump millions of gallons of gas and oil in to U.S. lakes and rivers each year. The bill would give the Environmental Protection Agency power to set standards for both old and new motors.

Exhibit C

NAVY FINDS FLAWS IN LOCKHEED SHIPS

The great Lockheed conglomerate, whose aircraft operations have become a front-page scandal, has also had unpublicized troubles with its shipbuilding. One piece of machinery aboard a Lockheed ship, according to the Navy Inspector's confidential report, was held together with baling wire.

The embattled corporation is building five new destroyers for the Navy in Seattle. Navy inspectors found enough problems in the first Lockheed ship, the Rathburne, to fill a 148-page, single-spaced "Acceptance Trial Deficiency List."

"Lube oil leaks under turbine are cooking on turbine drain lines, possible fire hazard," is just one of the hundreds of faults found on the Rathburne.

A few others: "unreliable" weapons systems, malfunctioning radar, steering system breakdowns, hot pipes that lack guards "to protect ship's personnel from burn injuries," faulty firefighting gear. The goofs have now been laboriously corrected.

The second Lockheed destroyer, the Reasoner, also was plagued with problems. These included the machinery fastened by baling wire, numerous oil leaks, faulty welding and crumbling fire bricks in the boiler.

Only the last-minute intervention by an alert admiral in Washington held up the Reasoner's acceptance trials and prevented a possible disaster at sea.

Rear Adm. Nathan Sonenshein, 3,000 miles away from Seattle, studies his inspectors' pre-trial reports before the Reasoner was supposed to put to sea. He noted that fuel drips had been detected near the boilers and insulation was missing on hot steam pipes.

Lockheed put off the trials until the safety-related failures have been fixed to the admiral's satisfaction. Sonenshein says the Reasoner is now shipshape and should be accepted by the Navy this month.

GAS SCANDAL

We have reported how the Federal Power Commission, under the prod of Chairman John Nassikas, has suppressed its own figures and adopted the gas industry's figures to justify a $4 billion rate increase.

This staggering amount would be added to the monthly bills of the gas users.

The industry's request for higher rates is based upon gas reserve figures that FPC economists have warned may be off as much as 40 percent. Yet their warnings have been hushed up to keep the consumers from finding out how badly they would be bilked.

The sheer magnitude of the figures makes the story difficult to comprehend, but the documents Nassikas has tried to suppress show all too clearly that he has been scheming against the consumers.

As we have reported, the gas producers are trying to wangle a rate increase from the FPC for the natural gas they draw out of a vast Louisiana reservoir. At issue are trillions of cubic feet of Louisiana gas reserves, which eventually will supply half the nation.

To support their case for higher rates, the gas producers have furnished the FPC with figures which the FPC's economics chief, Haskell Wald, has challenged. He expressed his concern in a confidential memo, dated Dec. 1, 1970, to the legal office.

Like all bureaucratic communications, the memo was worded cautiously. Wald knew his boss, the fiery-tempered Nassikas, was pushing to raise the rates.

The figures provided by the American Gas Association, representing the producers, might be helpful on broad trends, Wald suggested tactfully. But the industry figures were highly questionable, he cautioned, for assessing the need for a rate increase.

Nassikas' general counsel, Gordon Gooch, completely ignored Wald's warnings and prepared an FPC brief so larded with pro-gas arguments that it is incredible it could have come from a federal regulatory agency established to protect the consumers.

Instead of condemning the industry's misleading figures, Gooch actually cited them as evidence that the gas producers deserve a rate increase.

Footnote: Gooch told us all sides presented their arguments at the hearings and all elements of the FPC were heeded in the preparation of his briefs. But he acknowledged the final wording, which omitted Wald's views, was his own. Wald, when we asked him about his memos, said: "You have no business having them. All that is an internal matter." Nassikas himself has refused to speak to us, claiming he can't comment while the case is before him.

Exhibit D

[From the Washington Post, June 23, 1971]

MAY 14 FPC GAS MEMO MOST DAMNING

(By Jack Anderson)

Of all the suppressed documents dealing with the attempt to add $4 billion to the consumers' gas bills, the most damning is a May 14 memo written by Federal Power Commission economists.

They flatly refused to go along with Chairman John Nassikas' plan to grant $4 billion in rate increases to Gulf, Texaco, Humble, Sunoco, Shell, Mobil, Phillips and other gas giants with holdings in the vast Louisiana natural gas fields.

Nassikas suppressed the economists' objections, ignored their figures and accepted the self-serving figures of the gas industry. We have already reported how he also withheld the facts from Congress and the public.

The case for raising rates was made by Nassikas' general counsel, Gordon Gooch, who drafted a lengthy legal brief justifying the gigantic hornswoggle.

The Office of Economics took vigorous exception to Gooch's figures, facts and arguments. Not only were ringing dissents made, but the economists demanded that their disagreement be written into the brief.

Instead, the dissenting memo was locked up with the other Nassikas papers, which reveal how the Federal Power Chairman has promoted gas interests instead of the public interest he was sworn to uphold.

Gooch contended in his legal brief, for instance, that an FPC "field audit served to verify the accuracy" of industry figures on natural gas reserves. The economists dissented.

Gooch also claimed that "capital is now and will continue to be in short supply" to "overcome the current gas supply crisis." This was a key argument for giving the gas boys what they wanted. The economists vigorously disagreed.

Gooch argued that granting the rate would automatically "make the drilling for gas . . . more attractive" to the gas companies. The economists objected.

Gooch's brief also made the point that "uncommitted proved reserve held by producers is extremely small" and, therefore, that the rate increases are necessary. Register our dissent, said the economists.

Dissents were entered against Gooch's pro-industry findings on the cost of wells, production, operations, exploration, and royalties. Indeed, the Office of Economics refused to go along with 13 consecutive pages of Gooch's brief, the heart of his argument for the $4 billion boondoggle.

In a word, the economists took exception almost to the entire Gooch case.

Yet Gooch buried the memo deep in his files and submitted his brief to the commissioners with no hint that the FPC's best economists had raised a howl against the $4 billion giveaway.

CAR REPAIR KICKBACK

Most auto body shops would think twice before committing to paper a kickback arrangement with insurance agents who send them clients' cars to be repaired.

No such modesty possessed Larry Brotman, president of Brotman Autobody Center, a Los Angeles repair service since 1935. Brotman gleaned the names of 100 insurance men from the telephone book and wrote them that "the big idea behind this letter is to tell you that I want to work with you.

"I have the pleasure of paying the rent for quite a few insurance men who refer their customers to me. You will receive as much as $80 for any referral you may make to me."

To further enhance the kickback scheme, Brotman agreed to provide the insurance clients with free cars during the repair work.

We asked Brotman about his brazen plan, and he was as frank as his letter. Yes, he said, "perhaps it was" unethical. But he said he was careful to avoid offering the kickback to insurance companies themselves, because this might have violated the law.

"These are kickbacks to (individual) agents," he explained. However, Brotman said, not a single insurance man had accepted a kickback and he had gotten only $390 in business of his 100 letters.

Brotman said his advertising agency put him up to the letter writing. But, he added ruefully, "It didn't work at all."

TOTAL RECALL

The Pentagon, wary of further leaks of the top secret documents on Vietnam which were front-paged by the New York Times, is recalling the 15 volumes of the documents known to exist. Actually, hints of the document's existence have been known to millions of Americans for months. PARADE's Lloyd Shearer first revealed that the controversial Vietnam volumes were being hidden away at the Pentagon. On Oct. 25, 1970, he wrote that "several months before Lyndon Johnson oozed him out of the Pentagon, (former Defense Secretary Robert McNamara) assigned a task force under Les Gelb to undertake the most thorough, in-depth study of the war.

"There are relatively few copies in existence," Shearer wrote. "There are no plans to make it public."

Exhibit E

[From the Washington Post, June 26, 1971]

SECRET GAS RATE SESSION IS THWARTED

As part of a Federal Power Commission effort to ramrod through a $4 billion gas rate increase, FPC officials set up an illegal, secret meeting with an industry spokesman only weeks before his case was to be heard.

The clandestine affair was thwarted by a pro-consumer FPC official who charged that the secret session would violate FPC regulations and could lead to a sellout to the natural gas industry.

We learned of the meeting from a sheaf of confidential documents which were slipped to us so that we might inform the public of the costly hornswaggle which would affect half the United States.

The plot to sock the American housewife with a shopping gas rate increase is a complicated affair, as we explained in earlier columns. What it boils down to is this:

FPC Chairman John Nassikas and his pro-industry underlings sought to grant $4 billion worth of increases by using gas industry figures which they had already been told were unreliable. These figures—disputed by Nassikas' own economics staff—attempt to show that the industry must get huge rate increases if it is to develop new gas reserves.

FPC rules clearly state that no staffer can meet off-the-record with a potential witness who is directly involved in a disputed case. This rule is designed to prevent the FPC from giving away its case or making any deals with the potent industries it is supposed to regulate.

Yet Tom Joyce, head of the Bureau of Natural Gas, set up a closed-door meeting between the FPC top brass and John Jacobs—the persuasive chairman of the Gas Reserves Committee of the American Gas Association.

The conference was expressly designed to exclude consumer advocates like the American Public Gas Association, who were also parties to the rate cases.

In a memo dated March 18, 1970, FPC General Counsel Gordon Gooch, the very man charged with enforcing the commission's rules, gave the meeting his personal approval—even though John Jacobs was scheduled to testify on the case on May 1, 1970.

On March 23, a few days before Jacobs was to huddle with his supposed regulators, an FPC official revolted.

Haskell Wald, head of the FPC Office of Economics and long a fighter for the consumer, outlined his apprehension in a confidential memorandum to General Counsel Gooch.

Wald's memo is worth quoting at length for it shows more vividly than any of the Nassikas papers the Byzantine world of the FPC, where pro-consumers and pro-industry factions are locked in combat.

"It will be a closed meeting," Wald wrote. "There will be no transcript or official minutes and there will not even be a public announcement that it is being held."

Some quarters already viewed the industry figures with "intense suspicion," Wald said. He warned of the "danger of criticism of word of the meeting and the subjects discussed reaches outsiders."

Jacobs would be "clued in" by the meeting on what his testimony should be and might "also gather suggestions on how he should shape the responses on cross-examination. No other witness will be given this advantage."

Wald frankly suggested it might well "create an impression of collusion." Finally, he said, such a meeting validated both written rules and "definite instructions" and therefore should be called off.

Wald's timely protest succeeded. The meeting was canceled a few days before it was to be held.

Gooch asserted to my associate Les Whitten that he was "responsible for calling it off." He did not mention Wald's protest or his own earlier approval of the meeting. Nassikas has declined comment. Jacobs was in Morocco and could not be reached.

Footnote: Rep. Neal Smith (D-Iowa), chairman of the House Small Business Special Problems subcommittee, is calling Nassikas in July to testify on our revelations. Our documents, said Smith, cast doubt on the FPC's figures. Smith said it appeared that small businessmen, housewives and the poor would be victimized by $4 billion increase.

BRAZILIAN SUGAR PLUM

We told earlier this month how millions of dollars in U.S. sugar quotas were handed to racist South Africa despite congressional strictures against buying sugar from nations that discriminate against American citizens.

We have now learned that the Brazilian dictatorship will receive a 519,909-ton sugar quota worth millions depsite a congressional edict from the House Agriculture Committee barring quotas to countries where the benefits don't sift down to the people who grow the sugar.

Instead, Brazil's dictatorship sees to it that the sugar oligarchs in the northeast plantations get the sugar cash from the U.S. Few of the benefits reach the workers.

Sen. Fred Harris (D-Okla.), however, has been working to curtail giveaways to countries where the American bounty never reaches the workers in the field.

Federal Power Commission—Release of Intra-Agency Documents

July 2, 1971.

(Area Rate Proceeding (Southern Louisiana)) [Docket Nos. AR61–2, et al. Docket No. AR69–1].

Pursuant to the "Order Concerning Ex Parte Communications and Authorizing Release of Intra-Agency Documents" and the authority which has been delegated to me thereunder, I designate the following intra-agency memoranda to be placed in the public file in the consolidated proceedings which bear the docket numbers AR61–2 and AR69–1:

Exhibit A. Memorandum to Chairman Nassikas from Chief, Office of Economics (Wald), dated February 12, 1971, subject: Comparison of Form 15 and AGA Statistics for Gas Reserves.

Exhibit B. Memorandum to Chairman Nassikas from Producer Division, Bureau of Natural Gas (McManus) dated February 13, 1970, Reliability of Proven Reserve Estimates.

Exhibit C. Memorandum to the General Counsel (Gooch) from Chief, Office of Economics (Wald) dated February 19, 1970, subject: Questions regarding AGA reserves data.

Exhibit D. Memorandum to Commission from Chief Econometrician, Office of Economics (Khazzoom) dated February 19, 1970, subject: Issues in Gas Rate Determination (referred to in item C, supra).

Exhibit E. Memorandum to Commission and Office Heads from Chief, Bureau of Natural Gas (Joyce) subject: Meeting on Gas Reserves Estimation Methods.

Exhibit F. Memorandum to Chief, Bureau of Natural Gas from Chief, Office of Economics dated March 11, 1970, Meeting with AGA Reserves Committee.

Exhibit G. Memorandum to Commission from General Counsel (Gooch) dated March 12, 1970, subject: Mr. Joyce's meeting on Gas reserves Estimation Methods with Mr. Jacobs.

Exhibit H. Memorandum to Mr. Mattingly, Office of General Counsel from Chief, Office of Economics (Wald) dated March 13, 1970, subject: Comments on Questions for AGA, copy to Gooch.

Exhibit I. Memorandum to Mr. Mattingly from F. W. Lawrence dated March 16, 1970, questions for Mr. Jacobs of AGA.

Exhibit J. Memorandum to Mr. Mattingly from Assistant Chief, Office of Economics (Schwartz) dated March 16, 1970, Comments Concerning Questions for Mr. Jacobs of AGA.

Exhibit K. Memorandum to Mr. Wald from Mr. Gooch dated March 18, 1970.

Exhibit L. Memorandum to Mr. Gooch from Mr. Wald dated March 18, 1970.

Exhibit M. Memorandum to General Counsel (Gooch) from Chief, Office of Economics dated March 19, 1970, Miscellaneous Observations on Arrangements for AGA Witness on Reserves Estimates.

Exhibit N. Memorandum to General Counsel (Gooch) from Chief, Office of Economics (Wald) dated March 23, 1970 subject: Propriety of Pre-hearing Off-the-Record Meeting with AGA Witness in AR69–1.

Exhibit O. Memorandum to Mr. Wald from Mr. Gooch dated March 25, 1970.

Exhibit X. Memorandum to Chief, Office of Economics (Wald) from General Counsel (Gooch) dated March 26, 1971, subject: Staff's Brief, AR61–2 and AR69–1; relating to memo dated March 23, 1971.

Exhibit Y. Memorandum to General Counsel (Gooch) from Chief, Office of Economics (Wald) dated March 26, 1971, subject: Relating to General Counsel's memo of March 26, 1971.

Exhibit Z. Memorandum to Mr. Mattingly from Assistant Chief, Office of Economics (Schwartz) dated April 2, 1971, subject: Review of Draft Brief in AR69–1.

Exhibit AA. Memorandum to David Schwartz from Richard V. Mattingly dated April 9, 1971, subject: Staff Brief in AR61–2 and AR69–1.

Exhibit BB. Memorandum to Mr. Mattingly from Chief, Office of Economics (Wald) dated April 20, 1971, Comment on Initial Staff Brief, AR61–2 and AR69–1.

Exhibit CC. Memorandum to Mr. Mattingly from Office of Economics dated April 20, 1971, Response to Objections to the Econometric Model.

Exhibit DD. Memorandum to Phyllis H. Kline from Mr. Mattingly dated April 21, 1971, subject; the Econometric Model.

Exhibit EE. Memorandum to Chief, Office of Economics (Wald) from Mr. Mattingly dated April 21, 1971, subject: Southern Louisiana Brief.

Exhibit FF. Memorandum to Mr. Mattingly from Assistant Chief, Office of Economics (Schwartz) dated April 30, 1971, Comments Concerning AR69–1 Reply Brief.

Exhibit GG. Memorandum to Messrs. Gooch and Joyce from Assistant Chief, Office of Economics (Schwartz) dated May 14, 1971, transmitting alternatives A, B, and C to errata of reply brief.

KENNETH F. PLUMB, *Secretary.*

Exhibit GG

MAY 14, 1971.

MESSRS. GORDON GOOCH, THOMAS J. JOYCE,
Assistant Chief, Office of Economics

Attached are the alternatives which were prepared in conformance with our discussion last evening with the Executive Director. The explanation provided on alternatives A and B are self-explanatory. Alternative C relates to a proposed errata going to the initial brief which I feel is necessary if alternative B (which represents the OGC–BNG position) is adopted.

DAVID S. SCHWARTZ.

Attachment.

Alternative A

This alternative is premised upon the OEC position that there be equal treatment of all Offices and Bureaus where there is a difference of position on various issues.

The following changes should be added to the proposed errata to Staff Reply Brief in AR61–2, *et al.* and AR69–1.

3. A footnote should be added immediately following the heading at the top of page 39 to read as follows:

"[1] The views expressed at pages 39–41 of this brief dealing with the reliability of cost estimates are the views of the Office of the General Counsel and the Bureau of Natural Gas."

4. A footnote should be added immediately following the heading at the top of page 42 to read as follows:

"[1] The views expressed at pages 42–43 of this brief dealing with new gas well gas cost issues are the views of the Office of the General Counsel and the Bureau of Natural Gas."

Alternative B

This alternative is premised upon the OGC–BNG position that these Bureaus represent the staff view and therefore OEC should except to any material that they do not agree with.

The following changes should be added to the proposed errata to Staff Reply Brief in AR61–2, et al. and AR69–1.

3. A footnote should be added immediately following the heading at the top of page 39 to read as follows:

"[1] The Office of Economics excepts to the views expressed at pages 39–41 of this brief dealing with the reliability of cost estimates."

4. A footnote should be added immediately following the heading at the top of page 42 to read as follows:

"[1] The Office of Economics excepts to the views expressed at pages 42–48 of this brief dealing with new gas well gas cost issues.

Alternative C

BEFORE THE FEDERAL POWER COMMISSION

Area Rate Proceedings (Southern Louisiana Area) [Docket Nos. AR61–2, et al. and AR69–1]

ERRATA TO STAFF INITIAL BRIEF

The following changes should be made in the initial brief submitted by the staff in these consolidated proceedings.

1. The Office of Economics excepts to the following sentence on page 10 contained in the section of the brief dealing with the gas supply situation:

"The staff's field audit served to verify the accuracy of the uncommitted reserves volumes as initially reported. (TR 5201–02)."

2. The Office of Economics excepts to the following sentences on page 19 contained in the section of the brief dealing with the availability of resources:

"The evidence in the present record indicates that capital is now and will continue to be in short supply in relation to the capital requirements necessary to overcome the current gas supply crisis. (TR 1465, 6771). * * * The need for internally generated funds to finance an increased program of exploration must therefore be considered in the establishment of rates for gas already dedicated under long-term contracts."

3. The Office of Economics excepts to the following sentence on page 20 in the staff brief dealing with the response of gas supply to price:

"It is also contrary to the facts, which show that the volume of uncommitted proved reserves held by producers is extremely small."

4. The Office of Economics excepts to the following sentences on pages 23 and 24 in the section of the staff brief dealing with the response of gas supply to price:

"Price increases for gas will obviously make the drilling for gas more profitable and therefore more attractive.*** If the requirements for wildcat acreage, equipment, labor, and capital are met, then an increase in gas price can be expected to have a direct, positive effect on the exploration effort, and the greater the price increase the greater will be the increase in the exploration effort, until the point of full resource utilization is reached. Beyond this point price increases will have little effect. (Ibid.)."

5. A footnote should be added immediately following the heading at the top of page 61 to read as follows:

"[1] The Office of Economics excepts to the views expressed at pages 61–64 dealing with the American Gas Association reserves data."

6. A footnote should be added immediately following the heading at the top of page 66 to read as follows:

"[1] The Office of Economics excepts to the views expressed at pages 66–80 dealing with the recent nationwide cost of nonassociated gas."

7. The Office of Economics excepts to the following sentences on page 95 dealing with the elimination of offshore price differentials:

"As noted earlier, the industry paid approximately $850 million for offshore leases in December 1970. The cost of carrying the investment in these leases for one year at 13 percent is $110 million. If this total cost is spread over the current offshore production volume of about 1.4 TCF, the unit cost result is almost 8 cents per Mcf. It is true that some leases involved will undoubtedly be transferred to producing accounts or written off during the first year. Nevertheless, this provides a striking measure of the cost of doing business in the offshore area.

"From the standpoint of both risk and cost, the evidence of record fully justifies elimination of offshore price differentials."

Respectfully submitted.

RICHARD V. MATTINGLY, Jr.,
Commission Staff Counsel.

Exhibit FF

APRIL 30, 1971.

Memorandum to: Richard V. Mattingly, Jr., Office of the General Counsel.
From: Assistant Chief, Office of Economics.
Subject: Comments Concerning AR69–1 Reply Brief.

I have reviewed the proposed Reply Brief in AR69–1 and discern that there are two areas which are directly related to economic analysis. I will address myself to these areas with the hope that you will objectively evaluate my comments and modify the presentation.

In the section entitled, "Supply Demand Issues," there is a subsection (page 4) designated as "III. *Interest Rates Do Not Account for the Gas Shortage.*" As you are aware (See memo of April 12, 1971 pertaining to Initial Brief in AR69–1.), I do not feel that you have accurately assessed the impact of high interest rates on the cost of money and the profitability of developing and exploring for marginal prospects. In addition, I believe that discussion on pages 4–6 is contradicted by the testimony of Witness Stalon (OEC) with respect to the impact of interest rates on the cost of holding gas in the ground and the effects on the producers' incentives to explore and drill for new reserves.

As Stalon indicated it is an elementary principle of economics that where we have a positive interest rate a dollar received today is worth more than a dollar received in the future. Therefore if we utilize a 10% rate of interest this would mean that the present market value of a dollar to be received one year from today will be approximately 91¢ and two years from today about 82¢. The present value of money to be received in the future depends on the rate of interest which is used for discounting the future payments. The higher the interest rate, the greater the likelihood that producers will defer decisions to develop potential supplies or undertake new exploratory effort. Higher interest rates also penalize any withholding of reserves from the market.

In addition, it is difficult for me to understand the nature of your resistance in acknowledging the impact of high interest rates on the gas supply picture, in light of the fact that high nterest rates as a cost of capital component indicate the need for higher prices. This, I believe, is symmetrically related to the general thesis that you have been propounding concerning the inadequacies of prices as a causal factor for the present unavailability of supply.

In light of these factors, I slggest you modify the above-mentioned subsection along the lines of the language suggested below. I would change the heading to read as follows: "III. *The Gas Shortage Cannot Be Primarily Attributed to the High Rate of Interest.*" I would delete the first two sentences and substitute the following material: "MGD witness Paul Davidson stressed the importance of rising interest rates as a factor influencing the unavailability of gas in recent years. Unfortunately, he did not place the significance of high interest rates in a proper perspective. Obviously, since high interest rates result in a higher cost for holding gas, it would appear that this would run contrary to his contention that supplies are being held off the market because of anticipated higher ceiling prices. In addition, the higher interest rates provide a disincentive to withhold gas from the market. Lastly, higher interest rates associated with a higher cost of capital require higher gas prices because interest is a cost component to be considered in setting ceiling prices."

I would move the material following the first two sentences which I suggest you delete (going to the top of page 5) dealing with other factors involved in economic rent to follow the discussion of interest rates. Picking up on the first full paragraph on page 5, I would modify that sentence to read: "With respect to the specific issue of interest rates, it is obvious that Mr. Davidson failed to directly and precisely correlate the level of interest rate and its specific impact on gas supply." Then, I would follow up with the following language: "Interest rates should be viewed as one of the relevant factors involved in costs, along with the availability of resources including capital, and the relative profitability of alternative investment opportunities, as it affects the price required to bring forth necessary supplies."

I would eliminate the discussion starting with the first full sentence on page 6, "Consequently the effect . . . " until the conclusion of the section. These sentences erroneously convey the impression that high interest rates do not play an important role in development and exploratory activities.

In the section entitled, "The Reliability of Cost Estimates," there is a discussion of the producers' contention that it is difficult to determine unit costs of gas because it is a product produced under conditions of joint cost. My concern is that there appears to be a lack of comprehension concerning the distinction between joint and common costs. The discussion that follows distinguishing joint and common costs is provided to help you modify the material on the bottom of page 1 going over to page 2 of the above cited section.

Products produced under conditions of joint costs, such as beef and hides or cotton fiber and cotton seed, are produced in more or less fixed proportions. Therefore, you cannot vary the amount of one of the products without producing a corresponding proportion of the other product. Frm the standpoint of cost analysis, it can be seen that a joint cost is truely an unallocable cost.

Goods produced under conditions of common cost can be varied in amount even though the production process is indigeneous to both. Your discussion with regard to wellhead production of gas in contrast to the production of goods by "many major American industrial corporations" should be developed along the lines that I have suggested. What I think you are trying to say is that the many diverse products utilizing raw materials of varying amounts result in the production of goods which in fact share in common costs such as overhead costs and the capital investment in plant and equipment. In a multiproduct firm it is unnecessary to allocate common costs, since it is only necessary to maximize the excess of sales revenue from each product over the directly assignable costs of each product. Associated natural gas in fact is produced under conditions of joint costs similar to the examples given above (meat and hides) and is distinguishable from the situation involving common costs.

As I read your analysis there appears to be confusion on these points and I think it behooves the staff to provide a clear and accurate analysis of these very important economic concepts. It may be advisable to omit any reference to the nature of costing and pricing in American industry generally in light of the difficulties associated with generalizations of ths nature. I would be glad to discuss any of these matters with you prior to your finalization of the brief.

David S. Schwartz.

Exhibit EE

April 21, 1971.

Memorandum to: Chief. Office of Economics.
From: Richard Mattingly.
Subject: Southern Louisiana Brief.

Thank you for your recent memorandum concerning the staff brief in AR69-1. While I do not agree with you on the conclusions to be drawn from the December, 1970 offshore lease sale, I can nevertheless appreciate your position. I feel sure that had you brought this to my attention earlier an accommodation could have been reached.

As you may remember, you returned your copy of the AR69-1 draft brief to me without comment, and further indicated you did not wish to participate in the draft review procedures. Your instructions were to coordinate preparation of the brief with Dave Schwartz of your office. This procedure was followed. I had a number of discussions with Dave and with Roy Nierenberg of OGC. As a result of these discussions a number of substantive changes were made in the brief at their request, and it is my impression that virtually all disagreements were resolved to their satisfaction. However neither you, nor Dave mentioned the problem which you raise in your memorandum, and I was thus totally unaware of your disagreement.

Every effort should be made to resolve issues such as this at the staff level prior to issuance of the brief. Criticisms such as yours are essentially destructive rather than constructive when, as here, they are made after the fact. I assure you that I will continue to make every effort to accede to the suggestions advanced by your office on any issue, and I hope in the future any questions or disagreements will be brought to my attention in time to permit their resolution to the satisfaction of all concerned.

Exhibit DD

April 21, 1971.

Memorandum to: Phyllis H. Kline.
From: Richard Mattingly.
Subject: The Econometric Model.

Thank you for your recent memorandum concerning the econometric model. As suggested I have reviewed pages 45–48 of the brief as well as Exhibit No. 46 itself, in an effort to gain further insight into the critical issue of whether, how, and to what extent the model makes provision for existing or anticipated cost and profit levels in estimating the response of gas supply to price. This review serves to further confirm my prior conclusion that Dr. Khazzoom did not consider costs or profits, past, present or future, in any meaningful way.

Reference to page 45 of the brief indicates the analysis "implicitly considers costs", and "implicitly includes provision for profits". The implicit nature of the cost and profit analysis is emphasized again at page 48. In my opinion an "implicit" analysis of costs and profits by reference to prices or price trends is not sufficient. Specifically, historical ceiling price data do not indicate whether the sales at those prices were profitable, or if profitable, how profitable. Likewise, it is impossible to determine future profitability at any assumed price level without a related assumption as to anticipated cost. Profit is the primary incentive factor involved, and unless and until it is quantified for past periods and estimated for the future, its effect on the producing industry cannot be reliably predicted. In order to determine profit, it is necessary in turn to determine cost, since it is the difference between price and cost which determines profit or loss. These comparisons must in my view be explicit rather than implicit. This is especially true where there has been a substantial lapse of time since the last price increases. Such is the situation with respect to ceiling prices for natural gas, which have been more or less declining since 1960. It is probable that finding and producing costs have increased substantially during the period since 1960, and even substantial price increases at the present time may well go primarily to cover increased costs rather than contribute to increased producer profit. However, if an additional price increase were allowed a year later, the effect on producer profit and supply response could be expected to be much more positive, since cost increases would ordinarily be minimal over a one year period, and the bulk of the second price increase consequently would contribute primarily toward increased producer profit. Thus, the greater the period between price increases the greater the need to quantify costs and profits, and conversely the shorter the period between price increases the less the need to quantify costs and profits.

Probably more significant than the failure to adequately consider costs and profits is the lack of an adequate data base necessary to support the desired projections of supply response. Assuming future supply response can be predicted by reference to historical experience, it is nevertheless clear that judged by any reasonable standard the available historical ceiling price data are totally inadequate for the purpose. The data utilized by Dr. Khazzoom, as set forth at Table A–4 of Exhibit No. 46, indicate clearly that gas ceiling prices for all areas have generally declined or at best remained static during the entire period 1961–1969 as a result of Commission regulation through its Policy Statement No. 61–1, "in-line" proceedings, company-wide settlements, and area rate proceedings. As a result, these historical ceiling price data cannot be expected to provide a reliable basis for determining the response of gas supply to price *increases*, particularly increases of several cents per Mcf or even six cents per Mcf as recommended under the terms of the settlement proposal. This alone would seem to render the model fatally defective.

It might also be noted that the model does not measure the impact on supply of price increases for flowing gas. In my opinion this is a serious omission in Dr. Khazzoom's analysis, since the cost of finding new reserves must be defrayed largely out of revenues generated from current production. The availability of capital is a critical factor which simply cannot be ignored.

Going beyond even these considerations, however, it appears that the inherent unreliability of the Khazzoom model is demonstrated by the recently available gas reserves statistics for 1970. Reference to page 162 of Dr. Khazzoom's Exhibit No. 46 (Column 2) indicates that under the recommended equation 5**, nationwide new discoveries of approximately 2.7 TCF are projected for 1970. The actual volume of 1970 new discoveries as reported by the AGA amounted to 5.1 TCF.

Thus Dr. Khazzoom's nationwide forecast for 1970 was 90 percent in error. His forecast for selected districts was in error by over 50 percent and his forecast for Southern Louisiana was in error by 130 percent!

It therefore appears that the model is not only defective in theory but that it is also wholly unreliable in application. The evidence continues to demonstrate the futility of attempting to measure gas supply response to price by means of mathematical formulae where the necessary underlying information is not available. The lack of adequate data cannot be overemphasized.

Exhibit CC

April 20, 1971.

Re Response to Your Objections to the Econometric Model.

Mr. Richard V. Mattingly,
Office of the General Counsel,
Office of Economics.

Mr. Schwartz asked me to respond to your memorandum of April 9, "Staff Brief in AR61-2 and AR69-1."

Your objections to the econometric model are answered on pages 45-48 of the Staff Brief in the section headed: "F. The Staff's econometric analysis deals separately with the costs of inflation and real costs of finding future supplies of gas. Thus the analysis implicitly considers costs." In addition, we call your attention to the consideration of profitability by Dr. Khazzoom in Exhibit 46 (pages 9, 11, and 42-43, among others) and to his discussions of supply elasticity. The essence of the supply elasticity concept is the variation of costs (including profits) with changes in new gas supply.

It appears from your memorandum that you have missed the meaning of the supply elasticity estimates provided by the econometric model. These estimates measure the producer's response to price, but in doing so they also measure his response to costs and profitability. If costs had been too high, or profits too low, the response to price indicated by the model would not have occurred. Not only does the model include an explicit adjustment for the effects of inflation—since the prices are deflated by the wholesale price index—but it also includes a straight-forward recognition of changes in "real" costs.

We recognize that non-technicians will be baffled by the mathematics of the model, but there is no reason for anyone to fail to see that its purpose is to present a quantitative expression of the conventional supply curve showing rising supply with higher prices. The slope of the supply curve—that is, the amount of additional supply induced by each penny increase in price—is determined by the additional cost and additional profitability associated with new increments of supply. In one bold stroke, so to speak, the model analyzes the industry's past performance and derives estimates of the increment in price that is necessary to cover both the higher costs of an expanded supply and the increased profits to induce larger investment in gas exploration and development. It is of course assumed that the supply curve estimated from past observations offers a reasonable starting point for projecting the supply response to price in the years immediately ahead. Economic phenomena of this sort are usually characterized by systematic behavior.

We trust that this elementary explanation of supply curves will serve to assure you that Dr. Khazzoom did not overlook costs and profitability when he formulated his model. He did not want to engage in loose guesswork about future costs, instead, he devised a refined method of projecting these costs using tested equations based on past performance. If you know of a more reliable method of forecasting the probable supply response, we would welcome hearing about it.

Phyllis H. Kline.

Exhibit BB

April 20, 1971.

Re Comment on Initial Staff Brief, AR61-2 and AR69-1.

Mr. Richard V. Mattingly,
Office of General Counsel,
Chief, Office of Economics.

Permit me to call your attention to one line of argument in the Staff Brief which is completely erroneous. Noting that the industry paid approximately $850 million for offshore leases in December 1970, you draw the conclusion that "this provides a striking measure of the cost of doing business in the offshore area" (page 95). On the contrary, the staggering amount the industry *voluntarily* bid for these leases is a striking measure of the *high profits* anticipated from drilling the leases. The industry would not have paid as much as $850 million unless it estimated that it could afford to do so, and also pay a ⅙ royalty, and still reap an adequate return on its investment. In effect, the lease sale invited the industry to share its expected profits with the U.S. Treasury.

In other words, the correct interpretation of the $850 million is that the industry is optimistic about finding large reserves and selling the gas at a price which will yield revenues far in excess of the estimated costs. We do not know what price the industry used in its calculations. If the price was no higher than 26 cents per Mcf, in all probability the industry is anticipating lower unit costs offshore than onshore.

HASKELL P. WALD.

Exhibit AA

APRIL 9, 1971.

Memorandum To: David S. Schwartz and Roy A. Nierenberg.
From: Richard V. Mattingly, Jr.
Subject: Staff Brief in AR61–2 and AR69–1.

I have reviewed your draft on econometrics for the staff brief in AR61–2 and AR69–1. Based on my own analysis of this material and the evidence to which it relates, I conclude that Dr. Khazzoom did not consider in any meaningful way the level of profitability required to induce producers to commit capital to the search for non-associated gas reserves. More importantly, Dr. Khazzoom did not consider either the current or anticipated cost of finding and producing non-associated gas. As a result, the model does not determine what portion of any potential price increase would go to cover increased costs, and what portion, if any, would be left for the producer. In these circumstances it is difficult to understand how the model could be expected to forecast producer or supply response with any degree of reliability. The Khazzoom model seems clearly subject to the same fundamental criticism made of the Edmonston model, namely that it does not consider costs or profits. (*Austral*, 428 F. 2d 407, 436; footnote 91).

Nevertheless, I do not intend to prejudice your position on this issue, since it is for the Commission ultimately to decide. Accordingly, I have no objection to the inclusion of your material in the brief.

RICHARD V. MATTINGLY, Jr.

Exhibit Z

APRIL 2, 1971.

To: Richard Mattingly, Jr., Office of the General Counsel.
From: Assistant Chief, Office of Economics.
Subject: Review of Draft Brief in AR69–1.

The comments that follow are in response to your memo of March 30, 1971 and will be organized along two lines. Firstly, I will have some general observations with respect to the draft and, specifically, as it pertains to the OEC witnesses other than Dr. Khazzoom. Secondly, detailed comments relating to the section entitled, "The Response of Gas Supply to Price," will be provided.

General Comments

Unlike previous staff briefs in the various area rate proceedings, this draft does not provide a detailed analysis of the direct testimony of the various staff witnesses. The emphasis appears to be on providing the procedural history together with a very general evaluation of special problem areas relating to gas supply, the demand for gas, the desired level of service, and supply response to price and a number of specific considerations going to recommended rates and other special problems. While it appears that these are major areas for analytical effort, nonetheless, they are not fleshed out and documented with primary reliance upon testimony and exhibits of various staff witnesses. (With the exception of the anonymous reliance on Engel)

For example, there is no mention made of Mr. Lawrence's testimony or reliance on his exhibit in your discussion concerning the demand for gas or expected supply availability. Although it would appear from the subject headings of your draft, the purpose of his testimony would, indeed, be organically related to the subject matter. As you are aware, the objective of Lawrence's testimony as stated in the transcript is as follows:

"My testimony is concerned with the relationship between gas requirements and potential sources of supply in the near term future. In this testimony I compare the projected requirements for gas with the expected supply availability, including prospects for gas imports and synthetic gas. In addition, I review the potential new demands for gas which may develop during the next few years, and indicate the alternative sources of fuel which may be called upon in the event that the market for gas exceeds the available supply, and suggest steps to avoid a gas supply-demand imbalance.

While it is true that Dr. Charles Stalon's testimony is of a more theoretical nature and could not easily be fit into the framework of the draft as it is now postulated, nonetheless, this may reflect on the infirmities of the structure of the draft rather than on the lackofcogencyofStalon'spresentation.Asyouareaware the draft rather than on the lock of cogency of Stalon's presentation. As you are aware the purpose of Dr. Stalon's testimony is as follows:

"Stated broadly, the purpose is to provide an analytical framework for consideration by the Federal Power Commission (FPC) to use in reaching a tenable decision on the ceiling price to be established in this proceeding. This will be done by examining the structure of incentives within which the producers and users of natural gas make their decisions. The analysis concentrates on the role of "prices" and "costs" as determinants of the "supply" and "demand" for natural gas. The analysis is abstract in the sense that it simplifies and formulates a number of generalizations concerning economic processes which are in themselves exceedingly complex. The generalizations developed are then used to clarify the options available to the FPC in its role as regulator of field prices of natural gas. In summary, my objective is to provide for the record a set of economic principles which I think must be considered in establishing a price structure for natural gas."

Perhaps, the Office has no cause for complaint over your ignoring the testimony of Lawrence and Stalon because you have treated virtually all staff witnesses with an evenhanded disregard. By doing so you have seriously detracted from the value of your brief.

The Response of Gas Supply to Price

The primary concern of this Office goes to the above captioned section. This is particularly true because the material contained therein is unnecessarily at odds with the economic relationships postulated by the econometric model. I find the level of economic analysis contained in this section (pages 17–23) shallow, incorrect, and lacking in logical cohesiveness. For example, the sentence, "The proposition that gas supply is price elastic (i.e. responsive to price) would ordinarily be expected not to require extensive discussion," is meaningless. There is a multifaceted number of analytical concepts which could give this sentence meaning but they do not necessarily all move in one direction. We could have very little elasticity in the *short run* as a response to price, or greater than or less than unitary elasticity in the *long run* in response to price. To say that gas supply is price elastic does not tell you anything with regard to whether the elasticity is positive, negative, or unitary.

More disturbing is the reference to the earlier econometric model in AR61–2. No use is being made of this model by the staff because it has been replaced by the new model. It is totally inappropriate, therefore, to include a discussion of a model which was prepared 10 years ago to deal with the issues of that period (see below). In addition, the characterization of the model is a gross misstatement and completely contrary to its economic implications. Any discussion of that model in a staff brief should at least reflect an understanding of its basic features and should not mimic the attacks by politicians.

One must realize that when the earlier model was formulated, the cost of alternative fuels was at a level approximating the price of gas; in fact, in certain industrial markets coal was relatively less expensive. In addition there was no demand-supply imbalance; if anything, a surplus of gas overhanging the market. Therefore, the model indicated that a price increase could reduce demand and this then in turn would ultimately press upon the supply factor and reduce exploratory effort. It did not purport to show that gas supply was not responsive to price and was responsive primarily to demand irrespective of cost or profit considerations, as stated in your draft. I cannot understand why it is difficult for you to conceive of the fact that an increase in price for any commodity could in fact reduce demand if there are alternatives available or if consumers can curtail their consumption because of the higher cost now associated with its purchase. There are many examples of consumer response to price increase which resulted in a reduction of the demand for the product and subsequently, a reduction in the supply of the product. For example, look what happened to the demand for cars in 1970 after the increase in the price of cars over that obtaining in 1969.

The statement that subsequent history demonstrates the invalidity of the earlier economic studies is outright nonsense, because we now have a whole new set of factors in play (e.g., inflation, environmental concerns) which in fact were not existent at the time the earlier model was formulated. The Commission in not adopting the earlier model indicated its promise and urged continued effort to refine and perfect the results.

If the desire to discredit MGD Witness Davidson is predicated upon his position somewhat paralleling the results (as you perceive them) of the earlier model, I think there are more valid bases for criticizing his presentation. For example, his discussion of the industry's desire to withhold reserves to obtain higher prices could be criticized on the basis of his failure to calculate the cost of withholding reserves and the present value of the revenues that could be received from these reserves and, therefore, an inability to assess the economic advantage of selling gas in a period where interest rates are very high. Additionally, I think it is incorrect to deny, as you do on page 18, the fact that in a period of high interest rates the cost of money will affect the profitability of marginal prospects and will have an influence on new exploration.

One of our major concerns goes to your treatment of gas supply response to price (beginning on the bottom of page 20 and continuing through page 22) because this undermines the econometric testimony provided by Dr. Khazzoom. It is difficult for this Office to understand why the views of an engineer (Tr. pages 6770; 6791) should provide a predicate for a conclusionary statement (which follows) when the subject matter is uniquely economic in nature. The statement I am referring to is as follows:

"While the responsiveness of gas supply to price is certain, it is most difficult to accurately forecast in advance the specific volume of gas which will be discovered in relation to any given price."

The truth is this is another statement which superficially appears to have meaning but, in fact, is of very little substance. Certainly, gas supply will respond to price, but the important consideration is, how? Again, while it is difficult to forecast accurately with regard to new discoveries in relation to price, nonetheless, it is not impossible to do so within certain parameters and it obviously is appropriate for the staff to attempt a forecast. This, of course, is the objective of the econometric model, namely, to gauge the relationships of those factors that are affected by price and to interrelate those factors to get reasonable forecasts.

Another sentence which is difficult to understand (page 21) is as follows: ". . . then an increase in gas price can be expected to have a direct, positive effect on the exploration effort, and the greater the price increase the greater will be the increase in the exploration effort, until the point of full resource utilization is reached." The implications of the greater exploratory effort associated with ever increasing prices reflect the supply side of the equation. You seem to have divorced the implication of ever increasing prices on the demand side. Additionally, I do not know what is meant by "until the point of full resource utilization is reached." This appears to be a physical concept (extraction of gas from the ground) but I do not see its relationship to the prior discussion.

At page 21 (last sentence) you question the ability to determine the volume of reserves discovered which can be estimated from the amount of footage drilled. The fact is that BNG does assume that a certain volume of reserves will be forthcoming on the average from drilling activity and your statement runs contrary to the assumption in the BNG costing.

Lastly, you contend, because of the many variables, that it is meaningless to "project future supply" and that supply response "must be considered on the basis of an informed judgment." This, of course, begs the question. The econometric model was formulated as an empirical evidentiary predicate so that the Commission could exercise informed judgment. What I am fearful of is that your view of informed judgment excludes the necessary factual underpinning which is essential for intelligent informed judgment.

It may be advisable that we discuss the problems articulated before the draft is finalized.

David S. Schwartz.

Exhibit Y

MARCH 26, 1971.

Memorandum to: General Counsel.
From: Chief, Office of Economics.
Subject: Your Memo of March 26, 1971 (Re: Staff Brief in AR61–2 and AR69–1).

You are correct in stating that I am *not* seeking a commitment from you "that the brief will support the OEC position over the BNG position . . .". In the first place, there is no "OEC position," but only the testimony of an OEC witness, Dr. J. Daniel Khazzoom (and also that of other OEC witnesses whose testimony is not relevant to the subject of our exchange.) Secondly, there is no inconsistency between the prepared testimony of the BNG staff and Dr. Khazzoom's testimony. The only suggestion of a possible conflict is the following response of staff witness Engel to a question on cross-examination, "To what extent did you rely upon that econometric model?":

> Well, I did not rely upon this model specifically, because I feel that you cannot set forth in a mathematical formula the relationship between change in gas price and a change in supply to be forthcoming. But I do agree with the general proposition that a change in price is related to a change in gas supply to be forthcoming. (Tr. Page 7461, Volume 56.)

You will agree, I am sure, that the above statement can hardly be interpreted as expressing the "BNG position." In his prepared testimony Engel in fact calls attention to the Khazzoom model as addressing itself to the price-supply relationship. Furthermore, the opinion of a staff engineer does not dispose of a question which is uniquely within the province of a professional economist, namely, whether the price-supply relationship lends itself to quantitative analysis.

My March 23 memorandum was written to express our concern over Mr. Mattingly's apparent intention to inject his own personal skepticism of the value of econometrics into the staff brief. The staff presentation does not support such an argument which can only be interpreted as undermining the Khazzoom testimony.

Mr. David S. Schwartz is prepared to review the draft of the staff brief. It is our understanding that Mr. Mattingly is planning to have it ready about a week before it must be sent to the printing plant. Mr. Schwartz will discuss his comments with Mr. Mattingly and, if necessary, directly with you.

HASKELL P. WALD.

Exhibit X

MARCH 26, 1971.

Memorandum to: Mr. Wald, Chief, Office of Economics.
From: General Counsel.
Subject: Staff's Brief, AR61–2 and AR69–1; your memo dated March 23, 1971.

It is premature for me to interfere with the preparation of the brief in this case. Mr. Mattingly and Mr. Nierenberg have been given their assignments, and the brief when prepared, will be reviewed by me. At that time, I will be pleased to discuss any comments that you have. If, in fact, the BNG testimony is inconsistent with the OEC testimony, it will be necessary for Mr. Mattingly to deal with both. It is my intention to minimize any differences, but, if the record reflects inconsistencies, the brief can neither ignore nor conceal the inconsistencies. I am sure that you do not intend to seek a commitment from me at this point, that the brief will support the OEC position over the BNG position, whatever it is. It is the duty of the lawyers to bring all pertinent evidence to the attention of the Commission, regardless of its source.

GORDON GOOCH.

Exhibit W

MARCH 23, 1971.

Mr. Gordon Gooch, General Counsel.
Chief, Office of Economics.
Staff Brief, AR61–2 and AR69–1.

We are seriously concerned over a problem which has developed in connection with the preparation of the Staff Brief in this proceeding. We would welcome your assistance in resolving the problem at this early stage, but if you do not wish to involve yourself we would like you to delegate the responsibility to the appropriate person in OGC.

From our conversations with Mr. Mattingly we learned that he plans to take the position that it is impossible to establish a quantitative relationship between the price of natural gas and the supply response. If this line of argument is pursued in the Staff Brief, it would have the effect of undermining the value of the econometric testimony by Dr. Khazzoom.

You will agree, I am sure, on the desirability of a unified staff position in the Brief. Considering that the policy guidelines provided by the projections of the econometric model are consistent with the staff testimony on rate design and needed additional gas supplies, I believe that it is unnecessary for the Brief to argue, among other things, that a quanitative relationship between price and supply cannot be estimated within a reasonable range of reliability. The Commission should be encouraged to give as much weight to the econometric testimony as it finds appropriate based on the record before them.

We would appreciate the assistance of your Office in seeing that the Staff Brief does not expose a conflict of views within the Staff on the place of the econometric testimony in the staff case.

HASKELL P. WALD.

Exhibit V

DECEMBER 16, 1970.

Memorandum to: Chairman Nassikas.
From: General Counsel; Chief, Bureau of Natural Gas; Chief, Office of Economics.
Subject: Comparison of Offshore Southern Louisiana Reserve Estimates.

The memorandum of November 13 from the Office of Economics compares the estimate of Southern Louisiana reserves in the Federal Domain published by the American Gas Association (24.1 billion Mcf) with the figures which were introduced in AR69–1 in Staff ExhibitNo. 31–A for the same area and date (34.1 billion Mcf). The latter figure consists of the total of reserves volumes of gas dedicated to the interstate market, as estimated by the pipelines in their Form 15 reports, reserves volumes which pipelines estimate they hold under contract but have not yet been certificated, and uncommitted reserves volumes as estimated by the controlling producers. We do not believe that the difference in these two estimates should cause the Commission's staff to view either the AGA or the Form 15 volumes as being unreliable.

As is adequately explained in the attached memorandum from the Chief, Bureau of Natural Gas, the AGA uses different methods in estimating proved reserves in an area than are used by the pipelines when estimating reserves for their Form 15 reports. These differences become more pronounced in relatively undeveloped areas such as Offshore Southern Louisiana. As BNG's memorandum further points out, the difference in methods used by AGA and the staff witness in allocating "straddling" fields between the State area and the Federal Domain accounts for 2.1 billion Mcf of the difference in the estimates.

While the staff has not and does not suggest that a direct correlation exists between the estimates of reserves made by the pipelines in their Form 15 reports and those published by the AGA, the general trends shown by the Form 15 data for reserves to production ratios parallel and corroborate the trends of the AGA data for the same period of time. Insofar as such ratios are useful in assessing the adequacy of the current natural gas supply, the Form 15 reports tend to confirm the information supplied by the AGA.

The Commission has made use of AGA published estimates for additions to reserves and production volumes in determining certain unit cost components when setting area rates. The determination of the figures to be used for additions to reserves is based on trends ranging from five to fifteen years. The estimate of additions for any particular year, therefore, is significant only insofar as it may affect the long-term trend of reserves added. Since the cost components involved are calculated from annual additions to reserves, the estimate of total proved reserves at a point in time would not be a factor in the cost computations which have been used in setting area rates. The figures introduced in AR69–1 in Staff Exhibit No. 31–A do not in any way influence our opinion that the Commission may reasonably rely upon the AGA reserve figures.

As pointed out in the BNG memo, pipelines companies assign productive acres on the basis of a broader geologic interpretation than that used by AGA. However, even were the same geologic interpretations followed by both, the estimates which different geologists would make from the same geological and geophysical data would be likely to vary. The judgmental factors involved make mathematical precision impossible. Staff geologists believe that a difference of 20 percent, plus or minus, appearing in the estimates of two geologists would not establish ether estimate as being unreasonable. Thus a total range of 40 percent could be allowed and might even be conservative in a relatively undevelepod area such as the Federal Domain.

Memorandum to Chairman dated December 16, 1970, regarding Comparison of Offshore Southern Louisiana Reserve Estimates.

GORDON GOOCH,
General Counsel.
THOMAS J. JOYCE,
Chief, Bureau of Natural Gas.
HASKELL P. WALD,
Chief, Office of Economics.

Exhibit U

DECEMBER 1, 1970.

To: Mr. Wakefield

Please add an asterisk (*) after my signature and type in the following below:

"Comments by Mr. Wald:

1. A 40 percent allowance for judgmental factors may be appropriate for new fields without production experience, but not for fields which have been in production for a few years. Much of the offshore reserves is in the latter category.

2. I agree with the statement about corroboration of broad trends. However, the reliability of the AGA data for estimating unit costs or for assessing the adequacy of current supply is a separate issue—and a critical issue for the Commission's area rate decisions."

I would of course welcome the appropriate changes in the memorandum to accommodate my comments, so that I might sign without reservations.

HASKELL P. WALD.

Exhibit T

NOVEMBER 19, 1970

Memorandum to: John N. Nassikas, Chairman.

From: General Counsel.

Subject: Testimony on Gas Reserves Estimates in Docket No. AR69–1.

In a memo of November 13, the Chief, Office of Economics, directed the Chairman's attention to a possible discrepancy between reserves estimated by AGA and those estimated by Staff Witness Zabel in his Exhibit No. 31A which has been introduced in evidence in Docket No. AR69–1. This same comparison was made during the testimony of Associated Gas Distributors Witness Al Bass on October 14, 1970. See transcript pp. 5530 f. The existence and meaning of this discrepancy, if any, will be an issue when AR69–1 is before the Commission for decision.

GORDON GOOCH.

November 19, 1970.

Memorandum to: Chairman Nassikas.
From: Chief, Bureau of Natural Gas.
Subject: Docket No. AR69–1—Comparison of Offshore Federal Domain Reserves as Reported in Staff Exhibit No. 31–A and as Estimated by AGA.

This report has been prepared in response to your request of November 16, 1970. The reserve reported by staff are, at the most, 7.9 trillon cubic feet in excess of the reserves reported by AGA. The difference is readily explainable.

The AGA reports remaining recoverable reserves in the Offshore Federal Domain at December 31, 1969 of 24.1 trillion cubic feet. Staff Exhibit No. 31–A report, for the same area and date, reserves of 34.1 trillon cubic feet. The reserves reported in the staff exhibit represent an allocation of the reserve reported in Form 15 (27.6 trillion cubic feet), as supplemented by reserves reported by the pipeline companies as being dedicated but not in Form 15 (1.2 trillion cubic feet, Prehearing Exhibit No. 10), and by uncommitted and other reserves reported by the producing companies (5.3 trillion cubic feet, Commission Order of March 17, 1970). The reserves were not estimated by staff.

First, AGA and staff used different methods in the allocation of reserves, to State or Federal offshore Zones, for those fields which straddle the boundary between the State and Federal areas. AGA reported a total of 5.7 trillion cubic feet in these fields. Staff work papers also show a total of 5.7 trillion cubic feet in these fields. The AGA method of allocation placed 1.6 trillion cubic feet in the Federal Domain. The staff method placed 3.7 trillion cubic feet in the Federal Domain. Parties to the proceedings agreed that the staff method was superior to the AGA method and did not attack the staff method on cross-examination. The different methods of allocation would therefore reduce the difference in Federal Domain reserves to 7.9 trillion cubic feet from an apparent 10 trillion cubic feet.

The remaining difference can most probably be accounted for by the use, by AGA and pipeline companies, of different methods of estimating reserves in relatively wildest or undeveloped areas such as the Offshore Federal Domain. The AGA has stringent rules regarding the productive acres that can be assigned to a field in the early stages of development when only one to three or four wells have been completed. The pipeline companies, on the other hand, assign productive acres on the basis of a broader geologic interpretation. (See Appendix A for an example.) Of course, the greater the productive area, the greater the reserves.

As these wildcat areas achieve a greater stage of development, the reserve estimates of AGA and Form 15 gradually become closer, until in the more fully developed areas, they become comparable. This is shown by the reserve estimates reported above in the fields situated in both the State and Federal areas. These fields lie close to shore, in shallow water for the most part, and have reached a stage of high development. Both the AGA and Form 15 report 5.7 trillion cubic feet for these fields.

As can be seen from the above, care should be exercised when comparing the reserves reported in the Form 15 with reserves reported by another source in areas in the early stages of development. A better comparison can be made in larger, more fully developed areas.

Care should also be exercised when comparing Form 15 and AGA reserve data on an annual basis. AGA reserves are reported in the year of discovery, but these same reserves might not appear in a pipeline's Form 15 until a year or more later due to the necessity of obtaining a contract with the producer and a certificate from the Commission. Taking this in account, comparisons can be made between Form 15 and AGA in trends of reserve increases or decreases, particularly in the more fully developed areas.

Thomas J. Joyce.

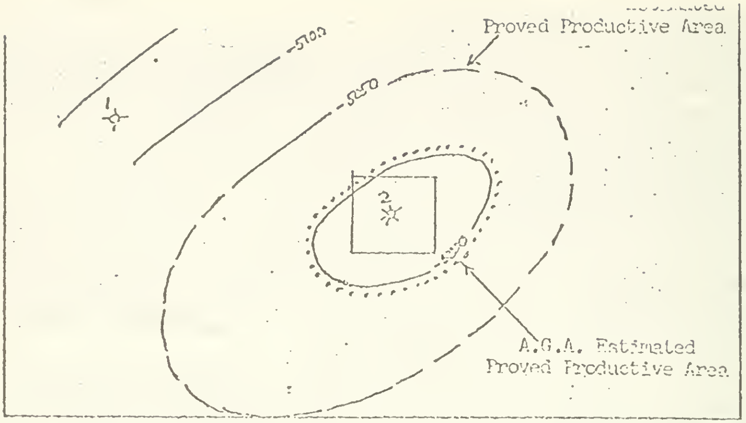
Proved Productive Area
-5100
-5050
-5000
1
2
A.G.A. Estimated
Proved Productive Area

FIGURE 1 - Well No. 1 was wet and abandoned. Well No. 2 discovered gas with deepest penetration of reservoir to - 5005. AGA proved-developed acreage in block around Well No. 2. AGA proved-undeveloped acreage is area inside dotted contour excluding block around Well No. 2.

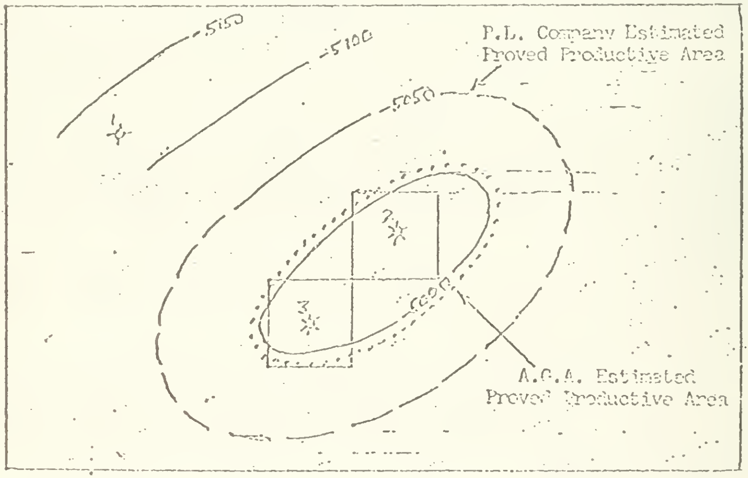
-5150
-5100
P.L. Company Estimated
Proved Productive Area
-5050
-5000
1
2
3
A.G.A. Estimated
Proved Productive Area

FIGURE 2 - Well No. 3 completed as gas well in same reservoir as Well No. 2. AGA proved-developed and proved-undeveloped areas are extended. Deepest penetration of reservoir remains at - 5005.

Exhibit R

NOVEMBER 13, 1970.

To: Chairman Nassikas.
From: Chief, Office of Economics.
Subject: Conflicting Estimates of Gas Reserves for Off-shore Louisiana (Federal Domain).

The information on uncommitted reserves which was collected for the AR69-1 proceeding is very useful for comparisons between the AGA estimates and the Form 15 reports to this Commission. Up until now we have had no way of filling the statistical gap represented by uncommitted reserves which are intended to be included in the AGA reports but are of course excluded from our Form 15 reports.

Mr. Ralph Johnson of our staff has compiled the following comparison for the Federal Domain Offshore Louisiana as of December 31, 1969:

	Reserves (billion Mcf)
Estimated by AGA	24. 1
Estimated by BNG staff witness [1]	34. 1
Difference	10. 0

[1] Exhibit No. 31A, Schedule No. 1.

The BNG staff estimate is 10 billion Mcf higher than the amount reported by AGA. The excess equals 42 percent of the AGA estimate. Several explanations are possible: (1) pipelines may be over-generous in reporting their dedicated reserves; (2) the AGA estimate may be based on more restrictive definitions than those followed by the pipelines; or (3) some reserves may escape the AGA reporting system. At the moment we do not know the true explanation.

The figures cited above are in the public record. The existence of so large a discrepancy between the two sets of estimates suggests that our Form 15 reports are useful for verifying the broad trends reported by AGA but not the reserves reported in particular producing areas.

A copy of this memorandum is being provided to Tom Joyce.

HASKELL P. WALD.

Exhibit Q

NOVEMBER 10, 1970.

Memorandum to: Chief, Office of Economics.
From: Ralph A. Johnson.
Subject: Comparison of 1969 AGA Reserve Estimates with Staff Reserve Data for South Louisiana (AR69-1)

AGA's Committee on Natural Gas Reserves reports that estimated proved reserves for South Louisiana—Federal Domain were 24,102,454 MMcf in 1969.

By comparison, staff reserve estimates for the same area in AR69-1 (Exhibit No. 31A, Schedule No. 1 totaled 34,138,851 MMcf in 1969.[1] Thus, the staff estimate exceeds AGA's estimate by 10,036,397 MMcf or 41.6 percent.

Apparently none of this substantial differential can be reconciled on basis of uncommitted reserves being omitted from AGA estimates. AGA's 1969 reserves publication (page 95) states:

> These reserve estimates constitute an annual inventory of proved reserves which include gas and natural gas liquids reserves of all types *regardless of size, availability of market, ultimate disposition or use.* (Emphasis Supplied)

A comparison of AGA and staff reserve estimates for the South Louisiana area (onshore and offshore) offers only a slightly better independent check of AGA estimates. AGA shows reserves of 80,769,437 MMcf compared to staff's estimate of 76,997,393 MMcf.

Since the staff estimate does not include intrastate reserves, it is, therefore, deficient by an undetermined amount. That amount is likely to be in excess of the differential (3,772,044) MMcf between the AGA and staff estimates.

Comment

Other things being equal, AGA reserve estimates should be greater than staff estimates since staff estimates do not include intrastate reserves. The reverse appears to be the case in this comparison.

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[1] Includes 1,094,607 MMcf available for sale.

On November 9, 1970, I spoke by phone with Mr. John C. Jacobs, Chairman of the AGA's Committee on Natural Gas Reserves. Mr. Jacobs confirmed that uncommitteed reserves are included in the AGA reserve estimates. He also suggested that a 10 percent differential in reserve estimates (AGA vs. staff) is not considered unreasonable.

To the extent that there is a differential greater than 10 percent between staff and AGA reserve estimates, AGA's estimates of the South Louisiana—Federal Domain reserves appear to be low. Conversely, staff estimates may be higher than reasonable for the area.

In summary, it appears that an independent check of AGA estimates of South Louisiana reserves indicates that there is a substantial difference in the amount of proved reserves that could be in the South Louisiana area.

RALPH A. JOHNSON.

Exhibit P

MARCH 27, 1970.

Memorandum to: The Chairman; Vice Chairman Brooke; Commissioner Nagge; Commissioner Carver; Commissioner O'Connor.
From: Chief, Bureau of Natural Gas.
Subject: Meeting on Gas Reserves, Estimation Methods.

The captioned meeting scheduled for April 2, 1970, is cancelled.

THOMAS J. JOYCE.

MARCH 25, 1970.

Exhibit O

Memorandum to: Mr. Wald.
From: Mr. Gooch.

HASKELL: I appreciate very much the concern expressed in your memo of March 23, 1970, questioning the "propriety of prehearing off-the-record meeting of AGA witness in AR69–1." While I find the reasons given in your memo are, if you will forget candor, wholly frivolous, I nevertheless have asked Mr. Joyce to postpone the meeting with Mr. Jacobs for the sole reason that you object. In doing so, let me make something very clear. Since the Jacobs meeting was not intended to affect—and would not have affected—expedition in AR69–1, I have accommodated you. Do not interpret this memo as a representation that the Office of the General Counsel will not confer with lawyers and witnesses outside of the staff. Such conferences are both legal and ethical.

As an example, OGC just put on a witness from Interior last week in the High Mountain Sheep case, even though Interior is an adversary party. If OGC is limited to staff witnesses and cannot even obtain relevant testimony from an outside witness, with or without a separate lawyer for the outside witness, as the witness chooses, I should know it as soon as possible. Such has been the practice for years, even before *Scenic Hudson*.

I will be happy to have my decisions reviewed at the Commission level. As a lawyer, I am bound to accept the methodology desired by the client, absent impropriety. Why don't you arrange for a meeting with the Chairman. Mr. Joyce should also be invited to attend.

GORDON GOOCH,
General Counsel.

Exhibit N

MARCH 23, 1970.

Memorandum to: General Counsel.
From: Chief, Office of Economics.
Subject: Propriety of Pre-Hearing Off-the-Record Meeting with AGA Witness in AR69–1.

As a follow-up to our telephone conversation, you asked for a memorandum explaining my concern over the propriety of the scheduled meeting of the FPC staff with Mr. John Jacobs, Chairman of the AGA Committee on Gas Reserves, on April 2. Mr. Jacobs is one of the witnesses being sponsored by a group of gas distribution companies in AR69–1. His testimony is due on May 1.

My reasons for concern are separate from any legal objections which might be made. I am not taking a position on whether the meeting would or would not violate either the letter or spirit of the Administrative Procedure Act or other rules governing the conduct of hearings on matters being litigated before regulatory bodies. The following discussion involves the question of propriety in an extra-legal context: Is there any possibility that the meeting will be interpreted by other parties as an improper attempt by the FPC staff to influence the witness' testimony or to elicit information which might be of value to them if it were made available on the record? Should we expose ourselves to the possibility of criticism because the meeting will afford an opportunity for the witness to influence the FPC staff?

As I recall the original purpose of the meeting, it was to discuss possible arrangements for FPC staff participation as observers in the work of the Committee on Gas Reserves. It now appears that the purpose has been extended to include discussion of all questions which our staff may have regarding the validity of the AGA estimates of proved reserves. I draw this conclusion from your memorandum of March 18 inviting the OEC staff (and, presumably, also the BNG staff) to take full advantage of the meeting with Mr. Jacobs to "ask him any and all questions that you wish, in any form that you wish, . . ." You made this suggestion partly because staff counsel Mattingly was unable to accept some of our ideas for framing the questions being submitted to Mr. Jacobs in advance of the hearing. We see an important distinction between submitting questions which will be part of the official record of the proceeding and convening an off-the-record meeting with Mr. Jacobs to explore on a preliminary basis many issues being contested by other parties to the proceeding.

The root of my concern is that the meeting has the appearance of an ex parte communication.[1] It will be a closed meeting, there will be no transcript or official minutes, and there will not even be a public announcement that it is being held. Anyone who appreciates the intense suspicion with which the AGA estimates are regarded in some quarters should be sensitive to the danger of criticism if word of the meeting and the subjects discussed reaches outsiders.

Moreover, I am not at all convinced that the meeting's broadened purpose is entirely consonant with the staff's role as an adversary party to the proceeding. In effect, we will be holding a "moot court." Not only will the AGA witness be clued in on various problem areas which he should be prepared to discuss in his testimony, but he may also gather suggestions on how he should shape his responses on cross-examination. No other witness will be given this advantage of trying out his answers on the staff and using the experience, if he wishes, to sharpen his defenses in advance of the hearing. Is it proper for the FPC staff to engage in an activity which may help an outside witness build his case? Will the fact that it will be done behind-the-scenes create an impression of collusion? Isn't there some advantage in eliciting spontaneous responses during cross-examination instead of well rehearsed ones? After all, our interest is in full and accurate disclosure, which may not be Mr. Jacobs primary motivation, since he may wish to build the best possible defense of the AGA statistics.

In my opinion, the meeting is not needed to aid the objective of rounding out the hearing record. This can be achieved in the usual manner—through cross-examination, interrogatories, rebuttal testimony, off-the-record conferences in the presence of the examiner and all parties, etc. The AGA witness will in any case be primed for our questions, since we have already submitted a list for him to cover in his testimony. What further gain will be realized by a trial run of his answers at the April 2 meeting?

It seems to me that a final decision on the meeting with Mr. Jacobs should be postponed until the above questions concerning the meeting's propriety are discussed with the Chairman or the full Commission. In the past we have operated under definite instructions to avoid private discussions with witnesses on matters in hearings. A change in these instructions should not be made at the staff level. If we are advised to go ahead with the meeting, some consideration should then be given to providing the participants with ground rules as to the content and conduct of the meeting.

HASKELL P. WALD.

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[1] The Commission's rule on *ex parte* communications (§ 1.4(d)) prohibits "any employee participating in the decision" from having off-the-record communications with a party to a proceeding on any matter at issue in a contested proceeding. Attendance by bureau or office chiefs (or their deputies) at the April 2 meeting would appear to violate this rule.

Exhibit M

MEMORANDUM

MARCH 19, 1970.

To: General counsel.
From: Chief, Office of Economics.
Subject: Miscellaneous observations on arrangements for AGA witness on reserves estimates.

1. In preparing the list of questions, I would like to see a distinction between mock questions and genuine inquiries. The first category would include all questions where the answers are public knowledge and our purpose in including them is simply to complete the hearing record. Instead of itemizing these mock questions, you might consider framing a general request to the AGA witness to submit for the record the information on AGA membership, reserves committee membership, etc., along with all published documents describing the work of the reserves committee and the definitions used. The Hearing Examiner could be asked to take official notice of these documents, or the parties could be asked to stipulate that the documents are official AGA publications. I believe that it is more appropriate to have this information provided as submissions for the hearing record rather than in question and answer form. The second category, which I describe as genuine inquiries, should be developed in depth so that there will be no misunderstanding as to what we are seeking.

2. Is there any possibility of our persuading the AGA witness to provide for the record various documents which have never before been released to the public? For example: written instructions to the members of the reserves committee; blank forms on which the raw data are compiled; meeting dates for the various subcommittees and parent committee; written decisions by the parent committee concerning the handling of difficult estimating problems, etc.

3. I believe that our correspondence with AGA should be placed in the public information file. Are you planning to do that? Should we give other parties the opportunity to supplement our list of questions?

4. Will there be an opportunity for us to add to our questions after the April 2 meeting with AGA? It is possible that the meeting will expose some important areas not covered in our original list.

5. In my opinion, the most knowledgeable academician on the subject of reserves estimates is Professor Wallace F. Lovejoy of Southern Methodist University. His book, *Methods of Estimating Reserves of Crude Oil, Natural Gas, and Natural Gas Liquids* (published by Resources for the Future in 1965) is easily the most penetrating critique of these estimates. Perhaps we should consider retaining Professor Lovejoy as a consultant to the staff for this phase of the AR69–1 proceeding. If we see a need for a rebuttal witness, he would be an excellent candidate.

6. I am concerned that we may be exaggerating the importance of the AGA reserves estimates. It is true that these estimates are crucial for the new gas costing, but they are not crucial for the end result. As you may know, I do not have any faith in the costing methodology and the resultant estimates. I believe that the most valuable source of information on the current gas supply situation lies in the experience of gas procurement personnel of pipeline companies. Are we confident that the pipeline companies will provide adequate testimony on their efforts to purchase new supplies and on the state of the gas supply market as they see it? Is there anything we can do in advance to make certain that the pipeline company witnesses will cover the subject in depth?

HASKELL P. WALD.

Exhibit L

MARCH 18, 1970.

To: Mr. Gooch.
From Mr. Wald.

Before the existing misunderstanding is compounded, I hasten to assure you that we firmly support—indeed, commend—your efforts to prepare the groundwork for helpful testimony from an AGA witness for AR69–1. My telephone call was motivated by surprise that our FPC lawyers are so flexible and that they believe we can submit advance questions without being accused of acting improperly on a matter that is in Hearing. It is a refreshing discovery to learn that we can strike out along new paths. Your analogy of a "regulatory Perry

Mason" fits staff counsel's role in many earlier cases. I consider it to be a misconceived role which should have been discharged long ago.

I hope you will agree with our view that Mattingly's list of 37 questions was the wrong approach even for a start. The questions must be developed in reasonable depth, so that the source of the staff's concern is clear to the AGA group. Mr. Schwartz gave our suggestions to Mr. Mattingly by memorandum of March 16. You could hardly have expected a prompter reply. (Mr. Lawrence also sent comments at the same time.) My own reply to Mattingly was sent within an hour of our receiving his list on Friday the 13th. My February 19 list of questions (which really contains all the information Mattingly needed to frame the questions which concern us) was prepared within a day or two of your request. This record does not indicate that we have caused delay.

We were unsuccessful in getting Tom Joyce to change the April 2 date for the meeting with Mr. Jacobs, Mr. Schwartz and I will be participating in a public utilities conference in Michigan on that day. Mr. Lawrence will attend the meeting and will be prepared to cover our areas of concern. Dr. Khazzoom will attend if he is able to wind up his conferences at M.I.T. on April 1 and return in time for the meeting.

We must protest any suggestion that our efforts to design a usable directionality questionnaire have been a source of unnecessary delay. At the close of the prehearing conference an agreement was reached with the producers for them to start compiling the information at once, without waiting for the final questionnaire. Negotiations on the revision were held up because Mattingly was out of the office for a period (owing to a death in his family). BNG (Don Fisher) had many substantive difficulties with the way the questionnaire was framed and our efforts have been aimed at accommodating his problems as well as at making certain that we will collect usable data. We are unable to support Mattingly's tendency to side with the producers as the quickest means of getting the matter settled. A worthless questionnaire, such as the staff has issued at times in the past, is worse than none at all.

HASKELL P. WALD.

Exhibit K

MARCH 18, 1970.

Memorandum to: Mr. Wald.
From: Mr. Gooch.

HASKELL: I have and note your and your office's memos criticizing the efforts of OGC and BNG to obtain complete testimony concerning AGA Reserves by submitting written questions to the witness through his counsel. I also note your telephone call to me suggesting that the submission of questions is somehow improper and that the lawyer should reserve all questions for cross-examination of the witness.

You must realize that AGA data is used by the staff. In fact, unless I have misunderstood you, you believe the data to be accurate, within reasonable limits. Two legal aspects are involved: One is admissibility—since, for the first time, a group has refused to stipulate; second is the weight to be accorded to the data. To resolve both questions, a witness is needed. I wanted the OGC lawyer to put the AGA witness on in order to make sure that there was a full and complete record for the consideration of the examiner and the Commission, as well as OEC and BNG. AGA prefers a distributor group lawyer. This is fine. We could act like a regulatory Perry Mason and save all questions for cross-examination as you suggest—but for what purpose? If the witness did not know an answer to a question, he would simply supply it by some other means—after delay. By advising him in advance of the areas of interest, he may cover any or all of these questions on his direct testimony, thereby providing information which we want. If his response needs clarification, cross-examination will afford an opportunity to do this. Result—no time wasted, and full and fair disclosure.

I would like to know if you still see anything improper in our submitting these interrogatories. If so, I would like to know why you would suggest that we reserve all questions for cross-examination.

As you know Jacobs will be here on April 2, not for purposes of preparing for AR69–1. Nevertheless, I would suggest that your office ask him any and all questions that you wish, in any form that you wish, since you find the efforts of my office to formulate the questions so unsatisfactory.

While I wish you to have full comprehension of these legal proceedings, my main concern is to avoid any delays in AR69–1 because of OEC. In my view, OEC has already delayed the directionality questionnaire. I want to make sure that your witnesses meet the schedule of testimony. Priority must be assigned to this.

GORDON GOOCH, *General Counsel.*

Exhibit J

MARCH 16, 1970.

Re Comments Concerning Questions for Mr. Jacobs of AGA

RICHARD V. MATTINGLY,
Office of the General Counsel
Assistant Chief, Office of Economics.

After a review of the proposed questions for Mr. Jacobs, I have concluded that it would be a Herculean task to redraft, restructure, and with precise specificity, to formulate question by question substitutes for the 37 appearing on the list. Therefore, I will focus on four major areas that are of particular significance to this Office and formulate the pertinent questions pertaining to this subject matter. As an aside, it should be noted that the information sought in questions 1 through 4 are already a matter of public record.

REVISIONS OF AGA RESERVES (QUESTIONS 29 THROUGH 37 ON YOUR LIST)

One of the essential problems is whether this category is a residual which commingles reporting errors as well as reclassifications of gas and oil wells, Therefore ,in line with Mr. Wald's memorandum to the General Counsel of February 19, 1970, entitled, "Questions Regarding AGA Reserves Data," the appropriate questions would indicate a clarification of the specifics identified in item 2. We should ask whether in fact the revisions category commingles reporting errors and reclassifications. Does the Committee have a year-by-year breakout of the errors as distinct from reclassifications? In those instances where sizable negative revisions for associated and dissolved gas were made, why were these not accompanied by equivalent revisions in oil reserves? Are these revisions made year-by-year or are they made intermittently depending upon a determination to re-examine the basic data? If they are made sporadically, what triggers the decisions to re-examine the data? Are these revisions made for all areas every year or are they made for some areas in one year and other areas in another year? Do the instructions provide that revisions are to be reported promptly when they are of certain magnitude or do they provide that they can be accumulated until a certain level of revision is indicated? Does the Committee have year-by-year data (and how far back) and is it feasible to publish a revised historical series adjusted for all reporting errors?

EXPENDIBLE HOLES (QUESTION 15)

Are the wells drilled and considered "expendable holes" in the offshore area included as successful wells when they are plugged even though commercial production from these wells is feasible and operationally possible? Are "expendable holes" included in proved reserves?

PROBABLE RESERVES CLASSIFICATION (QUESTIONS 22 AND 23)

What information does the Committee have with respect to reserves which have not been "proved up" and therefore could not be included in the proved reserve category? How far back does this information go? Can the Committee provide reliable reporting for a "probable" category in addition to its proved reserves delineation?

ECONOMIC ASSUMPTIONS IMPLICIT IN "UNDER EXISTING ECONOMIC AND OPERATION CONDITIONS" (QUESTIONS 16 AND 26 THROUGH 28)

The AGA Committee report indicates that the quantities of gas recoverable "under existing economic and operating conditions" are relevant to the proved reserves reported. There is no indication whether the reserve estimates relate to the prevailing price level of natural gas. If we assumed a price change upward or downward, what effect would this have on their estimate of proved reserves? If the price were changed, would the Committee re-examine its previous estimates and add gas volumes if the price were assumed to increase and reduce proven reserve estimates if the price were assumed to decrease? Is there any other connotation, other than price, in the terms "existing economic conditions"? If so, how do they affect proved reserve estimates?

In conclusion, I wish to indicate that I subscribe to the views Dr. Wald communicated to you in his memorandum of March 13, and I believe it will be difficult for us to reshape the questions on your list because of the general nature of their content.

DAVID S. SCHWARTZ.

Exhibit I

MARCH 16, 1970.

Re Questions for Mr. Jacobs of AGA.

RICHARD V. MATTINGLY,
Office of the General Counsel
F. W. LAWRENCE.

After reviewing the question proposed for Mr. Jacobs, I suggest the following additions or revisions:

2. (Revision) Can the current membership of the Committee on Natural Gas Reserves be revealed? If so, please show the membership. If not, please indicate what percentage of its members represent: (a) distributors, (b) pipelines, (c) producers, (d) others (specify).

5(a) What is the smallest geographical unit for which reserves are estimated? If state figures are the sum of areas within the state, can you indicate how many sub-areas are estimated but not shown? We would be interested in the number in each state or part of a state that is published.

11(a) Are all estimates (including those not published) compared with the estimate for a similar area for the previous year? Are revisions, extensions, and new field and new reservoirs computed for all areas or only for the areas pubpublished?

29(a) Are revisions to associated and dissolved gas reserves compared with revisions to oil reserves for the same area? Are revisions to NGL reserves compared to revisions to gas reserves?

38. Are area gas-oil ratios computed for oil fields?

F. W. LAWRENCE.

Exhibit H

MARCH 13, 1970.

Re Comments on Questions for AGA

Mr. RICHARD MATTINGLY,
Chief, Office of Economics.

I have hurriedly reviewed your list of questions and they are now being studied by others.

In my opinion, you are on the wrong track in the approach you have taken. I see no value in a long series of largely one-sentence questions. The key questions must be developed in depth if we are to elicit useful responses. For example, a general question on the economic assumptions underlying the estimates will bring a general answer, such as the explanation appearing in published sources. The committee has been asked the same question many times before, but they have never provided a response which satisfies us. You must frame your question so that they will understand why we are not satisfied with their earlier answers. That is the reason why my question on their economic assumptions focused on their nonsensical answers that price does not matter.

Another example of a question which should be spelled out is the one you ask about probable reserves. You should indicate to the committee that we are raising this question because of the likelihood that some information on probable reserves is already being collected along with the data on proved reserves.

Because of our basic dissatisfaction with the list as drafted, it is going to be difficult for us to be helpful to you in revising it.

HASKELL P. WALD.

Exhibit G

MARCH 12, 1970.

Memorandum to: The Commission.
From: General Counsel.
Subject: Mr. Joyce's meeting on gas reserves estimation methods with Mr. Jacobs.

Since Mr. Jacobs will be a witness in AR69–1 (Southern Louisiana) I suggest that the Commissioners and their personal staff refrain from attending the meeting.

Mr. Joyce understands the situation.

GORDON GOOCH.

Exhibit F

MARCH 11, 1970.

CHIEF, BUREAU OF NATURAL GAS,
Chief, Office of Economics,
Meeting with AGA Reserves Committee.

In advance of the April 2 meeting with the AGA Committee, I believe it would be appropriate for you or Mr. Gooch to distribute to the Commissioners my memorandum of February 19, addressed to the General Counsel, raising questions regarding the AGA reserves data.

As you know, Mr. Schwartz and I will be out of the city on the meeting day. Perhaps the best way to stimulate discussion on the questions in my memorandum would be for the Chairman or yourself to bring them up. I expect that Dr. Khazzoom and Mr. Lawrence will attend the meeting, but the "rules" for meetings of this sort tend to inhibit staff participation.

I would appreciate having your reaction to the above suggestion.

HASKELL P. WALD.

Exhibit C

FEBRUARY 19, 1970.

To: The General Counsel.
From: Chief, Office of Economics.
Subject: Questions regarding AGA reserves data.

Mr. Forquer asked us to submit a list of questions for discussion with the AGA Committee on Natural Gas Reserves. The following cover the more obvious questions which have concerned us for some time:

1. We are concerned over the apparent lack of adequate checks on the statistical reporting operations. A memorandum being distributed by Dr. Khazzoom to the Commission calls attention to a large reporting error in the reserves data for 1967. Because of the error, the 1967–1968 decline in reserves is overstated by 1.3 billion Mcf. If the Committee followed standard statistical procedure, they would have issued an errata sheet; instead, they adjusted for the error by reporting it as a negative revision in 1968. We would like to know whether there have been similar reporting errors of such large magnitude in the past. Would it be feasible to publish a revised historical series adjusted for all reporting errors? It should be obvious that our economists cannot make reliable studies of supply-price responses if the basic data are distorted by reporting errors.

2. We have several questions concerning the "revisions" category of reserve additions. It is a "catch-all" category including, for example, reporting errors such as the one mentioned above. It also includes reclassifications of gas and oil wells. In the case of some sizable negative revisions for associated and dissolved gas, we have noticed that they were not accompanied by equivalent revisions in oil reserves. We would ordinarily expect both types of revisions to be in the same direction. We believe that the Committee carries a responsibility to identify the sources of major revisions so that the analyst can make appropriate allowances in his interpretations of the data. Studying the year-to-year behavior of revisions, we suspect that the revisions are not the result of a continuing reappraisal of the estimates, but may instead be made sporadically depending upon when the estimators decide to re-examine the basic data. Thus, it is possible that the need for a revision may have been appreciated several years before the revision is reflected in the reported statistics. We wonder whether the Committee members are instructed to report revisions promptly, or whether they have some freedom in accumulating the revisions until the amount is large. Also, do they make revisions for all areas every year, or do they look at one area one year and another area next year?

3. The problem of "expendable holes" in the offshore area raises an interesting question. We understand that these wells are plugged even though commercial production is possible and that they are not counted as successful wells. We would like to know whether the discoveries from these "expendable holes" are included in proved reserves.

4. Is it possible for the AGA Committee to provide a breakdown of proved reserves between reserves dedicated to interstate pipelines and all other? Such a breakdown would facilitate comparison with our Form 15 reports. (It would also be very useful to include a category for reserves committed to the intrastate market and to direct industrial customers, but we may be going too far if we ask for such detail.)

5. The economic assumptions underlying the AGA reserve estimates have never been spelled out. The AGA Committee speaks of quantities recoverable

"under existing economic and operating conditions" without indicating whether their estimates are tied to the prevailing price level for natural gas. Several of us have questioned AGA representatives about a possible change in their estimate of proved reserves if FPC's ceiling prices were raised. The answer given to us is that a price change would not have any effect on the estimate. We cannot make any sense out of such an answer unless the Committee's reference to "economic conditions" does not mean anything. Each rise in field prices should bring an upward adjustment in the AGA estimate of recoverable reserves. When the price is changed, the Committee should re-examine its previous estimates and add in those gas volumes which had been excluded because they were uneconomic to produce but which can now be produced at a profit. If our analysis is wrong, we need a more rational explanation from the AGA Committee than has been offered in the past.

6. We believe that the AGA Committee is in a position to provide much more useful information than they are now publishing. Apart from the breakdowns and explanatory data discussed above, the Committee should be able to report a "probable" category which would be in addition to proved reserves. The estimation of proved reserves automatically carries with it some knowledge of reserves which are not yet "proved up." We understand that some pipeline financing is based on "probable reserves" which do not qualify for the proved reserves category. It would thus seem that, with a little more effort, the Committee could relax its restricted definition of proved reserves and provide the public with another piece of information useful for analyzing the gas supply situation.

HASKELL P. WALD.

Exhibit D

FEBRUARY 19, 1970.

Memorandum to: The Commission.
From: Chief Econometrician, Office of Economics.
Subject: Issue in Gas Rate Determination.

The attached is the first in a series of three papers on the subject. The second paper deals with the use of historical cost in determining the ceiling price for new gas, and the implication the procedure has on future levels of gas supply. The third is a proposal for an alternative structure for the ceiling price of natural gas.

J. DANIEL KHAZZOOM.

FEBRUARY 16, 1970.

Memorandum To: The Commission.
From: Chief Econometrician, Office of Economics.
Subject: The Nature of the Gas Supply Data.

In the final analysis, the question of whether or not an acute gas shortage does exist will have to be resolved by reference to empirical evidence. At present, the only evidence available—apart from the Commission's Form 15 reports—is the gas supply data published by the Committee on Natural Gas Reserves of the A.G.A. Many have expressed misgivings about the unknown nature of these data. This has been particularly true since the publication of the 1968 reserves estimates. Gross additions to gas reserves fell by 8.1 billion Mcf. About half of this amount (4.4 billion Mcf) occurred in the revisions of associated-dissolved gas.[1]

At present relatively little is known about the factors behind this enormous drop. Some of what is known raises several questions in one's mind about the nature of the reserve estimates. There are also implications to the quality of the data in past years.

In all fairness, we cannot expect any estimates to be robust enough to score 100% on every test. But a score *commensurate with the purpose for which the data are used* is and must be required. The more is at stake, the higher are the standards the data are required to meet.

If so little is known about the nature of the reserves data and if so many reservations have been expressed about them, would it not be wise to require them to pass the scrutiny tests that any other evidence is required to pass before they are accepted for important policy decisions. I wonder if we may not be asking too much of these data by requiring them to serve as the arbitrator in important questions such as the currently outstanding ones on the adequacy of gas supply. If we know more about the specifics, perhaps a different picture will emerge. One should not assume that the picture will necessarily turn out to be brighter. It may very well turn out to be dimmer than the data suggest—at least, it apparently was so in 1967. But whatever the true picture is, we ought to know it.

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[1] A.G.A., *Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas in the U.S. and Canada as of December 31, 1968,* Table VII, p. 126, and Table IX, p. 127.

The concepts and some of the practices used in reporting the reserves data were discussed elsewhere.[2] Improvements have been made, in the meantime.

One need not subscribe to one variant or another of a conspiracy theory in order to want to know more about the specifics that go in the make-up of the data. These data will be used as the ultimate ground on the basis of which important issues may have to be resolved. There are therefore legitimate questions to ask, if one is to find out whether these data measure up to the task. Let me cite two examples—first an illustration from the conceptual apparatus.

1. The concept of proved reserves as currently used has an economic content to it—proved reserves being quantities recoverable "under existing economic and operating conditions." [3] There is no elaboration on what is referred to as economic conditions. Yet it is of more than passing interest to know what factors are lumped under this term, and the way these are made to influence reserves estimates.[4] Logically we would expect gas price to influence reserve estimates. An increase in gas price may be expected to lead to upward revisions of gas reserves. Yet, the few industry men I talked to about the subject deny that this will happen. To the extent that this is indicative of the thinking among the members of the Committee on Natural Gas Reserves, (we do not know if there is agreement among the members on the interpretation of the concept) one may wonder if proved reserves data indeed represent amounts recoverable under current existing conditions. As it is, I find it difficult to conceive of economic conditions which influence reserves estimates, but which exclude gas price from the list. Be that as it may, it is important to know more about the way this concept (and similarly other concepts defined only in broad generalities) is translated in operational terms.

2. Accounting practices and reporting methods also influence the picture conveyed by the data of the underlying situation.

In 1968, gross additions to non-associated gas dropped by 4 billion Mcf—from 18 to 14 billion Mcf.[5] One-third of this drop (1.3 billion Mcf) was due to a computational error in the 1967 reserves for Texas R.R. Commission District 10. The error resulted in an overstatement of reserves in that district by .65 billion Mcf. When it was discovered in 1968 it was subtracted from the 1968 revisions.[6] As a result, a comparison of '68 with '67 shows an erroneous drop in reserves of 1.3 billion Mcf (double the .65 billion Mcf error).

How do the mechanics of the internal reporting work? Is there a system of checks through which data are channeled before publication? If adequate safeguards do exist, how did an error of this magnitude escape unnoticed?

Since the error was discovered in 1968, why was it withheld until 1969 when the 1968 report was published, rather than made known as soon as it was discovered? It is not uncommon for reporting agencies to send an errata sheet to the users of their statistics.

This is not to suggest that it would be comforting to know that supply in '68 was .65 billion higher and in 1967 .65 billion lower than reported. But to the extent that these data are to serve the decision maker as a signal of changing conditions, it does make a difference when the change is reported. The earlier the signal is received, the less drastic is the action necessary to correct imbalances.

From the accounting point of view, the procedure used in correcting for this error leaves much to be desired. Revisions refer to adjustments in gas reserves due to the availability of new geological and engineering information on reservoir characteristics. Certainly a computer error does not belong in this category.[7] Assuming the only medium for reporting this error were the 1968 report, it would have been far better to report errors of this nature unde a separate category, and trace them to their year of origin. This should do much to improve our notion of how gas reserves have been behaving.

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[2] Wallace F. Lovejoy and Paul T. Homam, *Methods of Estimating Reserves of Crude Oil, Natural Gas, and Natural Gas Liquids*, (Baltimore, Maryland: The Johns Hopkins Press, 1965), pp. 97–144.

[3] A.G.A., *op. cit.*, p. 103.

[4] Incidentally, an earlier definition (used up until 1966) of proved gas reserves made no explicit reference to economic conditions, but was qualified only with the proviso "under operating practices". Proved reserves of oil on the other hand were defined "under existing economic and operating conditions". A.G.A., *Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas in the U.S. and Canada, as of December, 1965*, pp. 6, 20.

[5] A.G.A., *op. cit.*, Table VIII, p. 121.

[6] Letter of Ed Parkes, Chairman of the Committee on Natural Gas Reserves to Honorable Lee C. White, dated July 11, 1969.

In itself this error does not constitute the central problem. But it is symptomatic of a situation that requires looking into. There may also be a problem of consistency and timing in the reporting of revisions. The effect is very similar to that of accumulated depreciation deducted in one or two years leaving several years with inflated profits and others with enormous losses. To some it may not matter when the depreciation is deducted—in one year or over several years. But no businessman would settle for such an accounting method. No decision maker can function effectively when his notions about the underlying conditions are subject to distortions by accounting imbalances. Data must reflect the underlying situation, if the decision maker is not to be lulled into complacency at one time, or rushed into hasty action under crisis conditions in another—when in fact neither may be warranted.

The task of developing reserves data parallel to A.G.A.'s to serve as a source of independent check may not be feasible for some time. But with so little known about available reserve data. I reiterate what I said earlier: it would be wise to require these data to pass the scrutiny test just as any other evidentiary material. This means that the process of compiling these data should be examined by the FPC to learn in more than a superficial way about the specifics that go into the make-up of these data. Where necessary, recommendations for improvements should be made—that is, if these data are to be accepted as evidence. The inquiry can be conducted by a third party, if necessary.

The task will take time to complete. For the present, it is inevitable that these data will have to be used in reaching a decision, as no alternative source of information exists. It would be very wise though to treat any findings on the basis of these data as provisional, and to limit the duration of any policy measure taken by the FPC on the basis of these findings to the time period necessary to complete such an inquiry.

J. DANIEL KHAZZOOM.

Exhibit E

Memorandum to: The Chairman, Vice Chairman Brooke, Commissioner Bagge, Commissioner Carver, Commissioner O'Connor, Bureau and Office Heads.
From: Chief, Bureau of Natural Gas.
Subject: Meeting on Gas Reserves Estimation Methods.

I have scheduled a meeting with Mr. John Jacobs, Chairman of the American Gas Association's Committee on Natural Gas Reserves, to discuss the A.G.A.'s methodology in developing reserve estimates. Mr. Jacobs may be accompanied by one or more committee members. The meeting will be held Thursday, April 2, 1970, at 2:00 p.m. in Room 2043.

Due to limited space, staff participation should be limited to those who can derive the most direct benefit from these discussions.

THOMAS J. JOYCE.

Exhibit B

FEBRUARY 13, 1970.

Memorandum to: The Chairman.
From: Producer Division, Bureau of Natural Gas.
Subject: Reliability of Proven Reserve Estimates.

It is believed the reliability of gas reserve estimates for any specific reservoir or field initially is suspect. As the field or reservoir is more fully developed by additional drilling and production proceeds, the reserve estimates are revised on the basis of such additional information and are much closer to the ultimate recoverable reserves. However, even after considerable production experience, unforeseen happenings such as failure of wells or an entire reservoir could make the estimate erroneous.

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[7] Negative extensions is another instance where data are reported under revisions when in fact they do not belong to that category. When the size of the reservoir proves to be larger than originally estimated, the difference in gas volume is reported as extensions. But when the reservoir size turns out to be smaller than originally estimated the difference is reported as negative revisions rather than extensions.

In assembling a total of reserve estimates, such as the AGA figures, the incipient initial unreliability of the individual estimates are of course reflected in the total. AGA recognizes this and by its use of revisions from year to year corrects, to a considerable degree, the first estimate errors. Thus, in the AGA reserve estimate series, a particular year (especially the latest) may be off.

The value of the AGA reserve estimates is that it is a statistical series compiled on a fairly consistent basis yearly and can be reliable when used as a trend or guideline. Thus, a reversal from the past in an aspect of the series such as the ratio of yearly findings exceeding yearly production if confirmed in the subsequent year with production exceeding estimated findings appears to be a reliable signal that additional exploratory effort is needed to enhance the existing gas supply.

RELIABILITY OF INDIVIDUAL FIELD RESERVE ESTIMATES

An example of disparity in initial recoverable reserve estimates is extracted from the Commission's Opinion No. 351 in the CATCO producer case. From 27 FPC 107, the following excerpt is taken.

Millions of cubic feet at 14.73 lb/in²a	CATCO	Tennessee	Examiner [1]
Initial recoverable reserves	711, 017	1, 322, 921	1, 305, 315
Recoverable reserves as of Jan. 1, 1960	650, 065	1, 261, 969	1, 244, 363
Salable reserves as of Jan. 1, 1960	642, 660	1, 245, 410	1, 228, 195

[1] The examiner admitted the experts' testimony conflicted, but after a detailed analysis selected the factors he thought better supported and derived his estimated reserve figure. 29 FPC 133.

The record shows that the major differences between CATCO and Tennessee relate to net pay (thickness of gas bearing formations), areal extent of the reservoirs, porosity values, and connate water content. In important instances, there were unreconcilable differences between the experts for CATCO and Tennessee, and the staff in its brief contended that the recoverable gas reserves of the four fields cannot be determined from the facts and testimony submitted by the parties. The staff, however, advocated using Tennessee's higher estimate to avoid injuring the public. On our part, the record does not permit us to arrive at a definite conclusion with respect to these reserves. . . ."

THE SHIP SHOAL BLOCK 28 FIELD RESERVE ESTIMATE

One of the most glaring miscalculations of initial reserve estimates occurred in connection with Transco's purchase of gas from several producers from offshore Louisiana in the Block 28 Ship Shoal Field. Transco's certificate application was in Docket No. G–16603. The original recoverable reserve estimates in 1959 was 202,050 MMcf and Transco's contracts with the producers had take-or-pay provisions based upon a 1 to 8030 ratio of recoverable reserves.[1] In 1960, the recoverable reserve estimate was 278,711 MMcf and in 1961, the estimate was 795,272 MMcf. In 1963, after addition of a deeper zone in 1961, the original recoverable reserve estimate had increased to 1,295,719 MMcf, a five-fold increase over the original estimate. This rapid increase in recoverable reserves, combined with other factors caused Transco to go into a large gas prepayment position (in the order of $30 million but reduced to $16 million at the end of 1968).

THE RAYNE FIELD IN-PLACE SALE RESERVE ESTIMATES

Opinion No. 322 (21 FPC 865) states the original recoverable reserve estimates for Rayne Field in 1959 were 988,771,000 Mcf and cites evidence of additional reserves in untested sands.

In Opinion No. 378 (29 FPC 251), Texas Eastern, the in-place purchaser, had increased its holding from approximately 79% to 81.5% and the reserve estimate was 1,021,329,000 Mcf.

After approximately ten years of production, in Opinion No. 565, the original recoverable reserve estimate used was 974,067,000 Mcf and was not contested in the proceedings. The figure was used principally to establish a rate of take for the producers.

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[1] Take-or-pay provisions were later amended to be based upon a 1 to 7300 ratio and in some contracts on a definite minimum quantity. Make-up time was also extended and is now ten years.

The reserve estimates in this case were fairly consistent throughout and the original estimate in 1959 was apparently a good one.

SUMMARY

Producer Division concludes that certainly initial reserve estimates are not necessarily reliable for concluding a gas supply shortage exists but that a statistical series, such as the AGA reserves studies consistently compiled over a period of years and revised as additional information is obtained, *is reliable* as a *signal or trend* to alert the Commission and the industry of a gas supply problem. This is especially true if the first signal, i.e., excess of production over findings is confirmed in a second year.

EDWARD M. MCNANUS,
Chief, Producer Division.

Exhibit A

U.S. MEMORANDUM

FEBRUARY 12, 1970.

To: Chairman Nassikas.
From: Chief, Office of Economics.
Subject: Comparison of Form 15 and AGA Statistics for Gas Reserves.

We have made a quick check of the consistency of the reserves data reported to FPC on Form 15 and the reserves data published by AGA. Our results are summarized below.

The trends of the two series over the 1963–1968 period are broadly similar, in that they both advance year-by-year until 1968 when they both declined. The annual changes, however, can hardly be said to match each other, as shown below: below:

	Increase (or decrease) over previous year, M ft³	
	AGA (revised)[1]	Form 15
1964	4,698	453
1965	5,282	2,255
1966	2,208	3,624
1967	3,623	3,694
1968	(6,046)	(3,392)

[1] AGA total excluding reserves in Alaska, California, Illinois, Michigan, and Indiana. Reserves in these States are no reported in form 15.

In the first two years, 1964 and 1965, the increases reported in Form 15 were much smaller than the increases reported by AGA. In the next two years, Form 15 showed larger increases in reserves than the AGA data, while in 1968 the decline shown in Form 15 was much smaller than the decline reported by AGA. The AGA total of proved reserves at the end of 1968 was lower than at the end of 1965, but the Form 15 total was 2 percent (or 3.9 billion Mcf) higher.

The differences noted above may be entirely consistent with 100 percent accuracy in the two series, since the series measure different quantities. Form 15 applies to dedicated reserves, defined as "remaining recoverable salable gas reserves committed to, controlled by, or possessed by the reporting pipeline company." Form 15 reserves are those reserves covered by FPC certificate authorizations.[1] The AGA estimates are for proved reserves, which presumably include the dedicated reserves pledged for FPC certificates, plus the reserves underlying intrastate contracts, plus all other economically recoverable reserves in proven acreage. There is of course no reason why the two annual series should always move together or maintain a constant relationship to each other, since the interstate pipelines may succeed in contracting for a very high proportion of new reserve additions (or uncommitted reserves) in one year and a low proportion in another year.

We probably have reliable information on the reserves available to support the certificated volumes of interstate pipeline companies, and we are therefore able to speak confidently about the adequacy of these reserves to serve the existing market, but our knowledge of uncommitted volumes is limited to the information we can glean from the more comprehensive AGA statistics which we have no way of corroborating. FPC auditing of the approximately 70 percent of the AGA total which is reported on Form 15 tells us nothing about the reliability of the estimates for the remaining 30 percent.

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[1] Warranted reserves (i.e., reserves guaranteed by contract but not supported by the dedication of specific proved sources of supply) are also included in Form 15.

We have also compared the AGA and Form 15 reports area by area for 1964 and 1968, using the published geographical breakdowns. This comparison revealed some surprisingly large differences between the two sets of estimates. The principal ones are listed below:

1. In the San Juan Basin Area, the Form 15 reserves are about 40 percent larger than the volumes reported by AGA. In Texas District 8 and in Wyoming, the Form 15 reserves are also appreciably larger than the corresponding AGA estimates. If both estimates rely on the same economic and geologic assumptions—apparently they do not—the Form 15 data should never exceed the AGA estimates unless there are reporting errors.
2. The Form 15 data provide very low coverage—35 percent or less—in several parts of Texas. The size of the Form 15 "sample" is only 20 percent of the AGA estimate in District 3, 30 percent in District 6, and 35 percent in District 4.
3. Between 1964 and 1968, the changes reported by AGA and Form 15 were in opposite directions in several areas. AGA reports a decline of 1.4 billion Mcf in Oklahoma from 1964 to 1968, while Form 15 shows an increase of 0.9 billion Mcf. On the other hand, in Texas District 4 AGA reports an increase of 1.6 billion Mcf during this period and Form 15 shows a decrease of 0.4 billion Mcf. There are other areas where the reported changes diverge. On the surface, large divergences of this sort are suspect, although it is always possible that they actually reflect major shifts in the relative holdings of interstate pipelines and others.
4. In several areas where the AGA and Form 15 estimates move in the same direction from 1964 to 1968, the magnitudes of the increases or decreases are surprisingly wide apart. For example:

Area	Change, 1964 to 1968 (billion M ft^3) AGA	Form 15
Kansas	−2.8	−1.3
North Louisiana	−.6	−1.3
South Louisiana	+9.5	+6.2
Texas, District 8	+2.2	+9.1

These results of our AGA-Form 15 statistical comparisons are not necessarily indicative of conflicting estimates, but they serve to illustrate how difficult it is to use the data from one source as a check on the accuracy of the data from the other source.

HASKELL P. WALD.

FEDERAL POWER COMMISSION,
Washington, D.C., June 24, 1971.

Hon. ——— ———,
House of Representatives,
Washington, D.C.

DEAR CONGRESSMAN: You have inquired concerning a series of falsely misleading articles in the Washington Post and other newspapers carrying Jack Anderson's syndicated column styled, "The Washington Merry-Go-Round."

I can assure you that the integrity of the regulatory process is being fully protected and observed at the Federal Power Commission by the Commission and by myself as Chairman, and I categorically repudiate any assertions to the contrary.

I am pleased to report that hearings relating to Federal Power Commission proceedings for the prescription of just and reasonable rates protective of the consumer interest have been announced by the House Small Business Committee, scheduled to begin on July 12, 1971. Specifically, we have been advised that the testimony of the Federal Power Commission will include a discussion of the following:

(1) Raw fuel companies acquiring competing energy resources and its effect on the natural gas shortage.

(2) Coal supply shortages and increases in electric power rates.

(3) FPC procedures for estimating natural gas reserves and recent statements challenging their validity.

(4) Brief discussion of the action taken by FPC to alleviate the natural gas shortage.

When these hearings have been concluded, the Committee Print will be available for public distribution.

I have enclosed a letter to you from the Federal Power Commission's General Counsel, Gordon Gooch, which is further responsive to your inquiry.

Very truly yours,

JOHN N. NASSIKAS, *Chairman.*

Enclosures.

FEDERAL POWER COMMISSION,
Washington, D.C., June 24, 1971.

DEAR CONGRESSMAN ——— ———: Your letter referring to a recent series of articles appearing in the Washington Post herein "Post," (and other papers) on June 14, 15, 20, and 23, 1971, under the by-line of Jack Anderson pertaining to a gas case pending before the Commission has been received. The Anderson articles advert to a gas rate case, the Southern Louisiana Area Rate cases, AR61–2, AR69–1, which are pending before the Commission for decision now, some 10 years after the case was first instituted, and after one appeal to the Court of Appeals and after petitions for writs of certiorari were denied by the Supreme Court of the United States. Please be assured that the claims made in those columns are materially inaccurate and that omissions of material facts have been made. As an index to the credibility of the articles, I enclose for your consideration (1) a copy of Staff Exhibit 31–A in evidence in AR69–1 (see Schedule 1, lines 20, 21) which is the evidence on reserves which Chairman Nassikas is alleged to have suppressed (Post, June 14) Appendix 1 (2) a copy of the "Errata to Staff Reply Brief" noting the dissent of the Office of Economics to portions of the Staff reply brief prepared by my office (Post, June 14 and 23), Appendix 2 (3) a copy of the order of the entire Commission waiving the examiner's (Mr. Rendelman) decision in the case (Post, June 14) Appendix 3.

I invited the Anderson associate who telephoned me to come to the Commission to review the evidence in the public record in the Southern Louisiana area rate cases, but he declined to do so.

While reporters such as Mr. Anderson are entitled to considerable license in the interpretation that they choose to place on such data as they wish to consider, conclusions made in newspapers are no substitute for evidence presented in cases before the Commission, nor are charges made in newspapers a substitute for judgments which Commissioners must make in the discharge of their responsibilities. It is now up to the five Commissioners to examine the evidence adduced by all parties to that proceeding, including the Commission Staff, to consider all arguments dealing with fact, law, or policy, and render a decision setting just and reasonable rates for the sales of natural gas to interstate pipelines in Southern Louisiana. That decision will be subject to appeal to the United States Court of Appeals by any party. Thus, the rates finally set will be tested, both by the Commission and the Courts, against the legal standards set by Congress and the applicable Court decisions. The Commission must establish a rate which will assure the public that gas supplies will be available when needed. The decision of the Commission in the *Southern Louisiana* case will be made public when issued.

Very truly yours,

GORDON GOOCH,
General Counsel.

Enclosures.

Appendix 1

EXHIBIT NO. 31-A (VHZ-2)

WITNESS: Victor H. Zabel

FEDERAL POWER COMMISSION

BUREAU OF NATURAL GAS

GAS RESERVES AND PRODUCTION DATA
FROM FPC FORM 15
AND SUPPLEMENTAL SOURCES
SOUTHERN LOUISIANA
DECEMBER 31, 1969

Docket No. AR69-1

Area Rate Proceeding

Southern Louisiana Area

WASHINGTON, D. C. 20426

September, 1970

GAS RESERVES AND PRODUCTION DATA FROM FPC FORM 15 AND SUPPLEMENTAL SOURCES SOUTHERN LOUISIANA—DOCKET NO. AR69-1, AREA RATE PROCEEDING SOUTHERN LOUISIANA AREA—TABLE OF CONTENTS

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SOUTHERN LOUISIANA AREA SUMMARY OF GAS RESERVES AND PRODUCTION STATE AREA AND FEDERAL DOMAIN AS OF DEC. 31, 1969

[All volumes in MM ft³ @ $14.73 lb/in ²a]

Line	Area	Source	Item	Original recoverable reserves			1969 Production	Remaining recoverable reserves			
				Total	Non-associated	Association/dissolved		Total	Non-associated	Association/dissolved	Undesignated
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
1	State area:										
2	Onshore	Form 15[1]	Dedicated to pipelines				3,097,331	34,034,982	28,111,860	5,185,162	737,960
3	Offshore zone 1	Form 15	do				387,178	5,254,425	4,062,806	315,688	875,931
4	Subtotal	do	do				3,484,509	39,289,407	32,174,666	5,500,850	1,613,891
5	Onshore plus zone 1	Pipeline[2]	Dedicated—Not in form 15				0	105,922	65,691	40,231	
6	Subtotal	Lines 4 plus 5	Dedicated to pipelines				3,484,509	39,395,329	32,240,357	5,541,081	1,613,891
7	Onshore plus zone 1	Producers[3]	Held for warranty				175,812	1,954,232			1,954,232
8	do	Producers	Available for sale				0	1,508,981			1,508,981
9	Subtotal	Lines 7 plus 8	Producers				175,812	3,463,213			3,463,213
10	Total State area	Lines 6 plus 9	Available to interstate				3,660,321	42,858,542	32,240,357	5,541,081	5,077,104
11	Federal domain:										
12	Offshore zones 2, 3, 4	Form 15	Dedicated to pipelines				1,464,405	27,659,043	22,751,772	4,249,678	657,503
13	do	Pipelines	Dedicated—Not in form 15				0	1,205,001	934,539	270,462	
14	Subtotal	Lines 12 plus 13	Dedicated to pipelines				1,464,405	28,864,044	23,686,311	4,520,230	657,503

15	Offshore zones 2, 3, 4	Producers	Direct industrial sales	(4)	1,405,614			1,405,614
16	do	do	Fuel, feedstock, company use	(4)	962,373			962,373
17	do	do	Held for warranty	162,940	1,812,213			1,812,213
18	do	do	Available for sale	0	1,094,607			1,094,607
19	Subtotal	Lines 15, 16, 17, 18	Producers	162,940	5,274,807			5,274,807
20	Total Federal domain	Lines 14 plus 19	As reported	1,627,345	34,138,851	23,686,311	4,520,230	5,932,310
21	do	Lines 20 minus (15 plus 16).	Available to interstate	1,627,345	31,770,864	23,686,311	4,520,230	3,564,232
22	Southern Louisiana area:							
23	State and Federal	Form 15	Dedicated to pipelines	4,948,914	66,948,450	54,926,438	9,750,618	2,271,394
24	do	Pipelines	Dedicated—Not in form 15	0	1,310,923	1,000,230	310,693	
25	Subtotal	Lines 23 plus 24	Dedicated to pipelines	4,948,914	68,259,373	55,926,668	10,061,311	2,271,394
26	Federal domain	Producers	Direct industrial sales	(4)	1,405,614			1,405,614
27	do	do	Fuel, feedstock, company use	(4)	962,373			962,373
28	State and Federal	do	Held for warranty	[1] 338,752	3,766,445			3,766,445
29	do	do	Available for sale	0	2,603,588			2,603,588
30	Subtotal	Lines 26, 27, 28, 29	Producers	338,752	8,738,020			8,738,020
31	Total southern Louisiana	Lines 25 plus 30	As reported	5,287,666	76,997,333	55,926,668	10,061,311	11,009,414
32	do	Lines 31 minus (26 plus 27)	Available to interstate	5,287,666	74,629,406	55,926,668	10,061,311	8,641,427

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[1] FPC Form 15, Natural Gas Companies, Annual Report of Gas Supply.
[2] Docket No. AR69-1, prehearing exhibit No. 10.
[3] Docket No. AR69-1, exhibit No. 27 (DWA-1).
[4] Not available.

SCHEDULE NO. 2

SOUTHERN LOUISIANA AREA GAS RESERVES AND PRODUCTION TRENDS, 1963 TO 1969, DATA FROM FPC FORM 15 REPORTS

[All volumes in MM ft³ at 14.73 lb/in²a]

Line	Year (a)	Onshore (b)	Offshore zone 1 (c)	Total State Area (d) (cols. b+c)	Offshore Federal Domain (e)	Total southern Louisiana (f) (cols. d+e)	Warranty contracts (g)	Total area with warranty contracts (h) (cols. f+g)	Federal densin percent relationship [2] Of offshore (i) (cols. e/c+e)	Federal densin percent relationship [2] Of total southern Louisiana (j) (cols. e/f)
1	Remaining recoverable reserves:									
2	1963	43, 559, 415	4, 452, 301	48, 011, 716	14, 048, 448	62, 060, 164	4, 488, 132	66, 548, 296	75.9	22.6
3	1964	42, 201 342	4, 674, 285	46, 875, 627	14, 570, 795	61, 446, 422	4, 517, 036	65, 963, 458	75.7	23.7
4	1965	41, 503, 948	5, 095, 395	46, 599, 343	17, 088, 894	63, 688, 237	5, 227, 614	68, 915, 851	77.0	26.8
5	1966	39, 502, 368	6, 003, 155	45, 505, 523	18, 868, 044	64, 373, 567	5, 445, 980	69, 819, 547	75.9	29.3
6	1967	39, 105, 538	6, 013, 176	45, 118, 714	21, 221, 801	66, 340, 515	6, 388, 676	72, 729, 191	77.9	32.0
7	1968	36, 944, 246	5, 454, 050	42, 398, 296	23, 710, 877	66 109 173	6 053, 145	72, 162, 318	81.3	35.9
8	1969	34, 034, 982	5, 254, 425	39, 289, 407	27, 659, 043	66, 948, 450	6, 340, 947	73, 289, 397	84.0	41.3
9	Annual production:									
10	1963	2, 082, 065	152, 193	2, 234, 258	489, 347	2, 723 605		2, 723, 605	76.3	18.0
11	1964	2, 234, 855	147, 710	2, 382, 565	556, 706	2, 939, 271	9, 526	2, 948, 797	79.0	18.9
12	1965	2, 332, 622	185, 614	2, 518, 236	616, 692	3, 134, 928	62, 611	3, 197, 539	76.9	19.7
13	1966	2, 503, 191	216, 336	2, 719, 527	789, 268	3, 508, 795	114, 565	3, 623, 360	78.5	22.5
14	1967	2, 695, 555	335, 760	3, 031, 315	952, 254	3, 983, 569	210, 445	4, 194, 014	73.9	23.9
15	1968	2, 854, 611	337, 255	3, 191, 866	1, 121, 370	4, 313, 236	335, 532	4, 648, 768	76.9	26.0
16	1969	3, 097, 331	387, 178	3, 484, 509	1, 464, 405	4, 948, 914	338, 752	5, 287, 666	79.1	29.6
17	Annual revisions and additions: [1]									
18	1963									
19	1964	876, 782	369, 694	1, 246, 476	1, 079, 053	2, 325, 529	38, 430	2, 363, 959	74.5	46.5
20	1965	1, 635, 228	606, 724	2, 241, 952	3, 134, 791	5, 376, 743	773, 189	6, 149, 932	83.8	58.3
21	1966	501, 611	1, 124, 096	1, 625 707	2, 568, 418	4, 194 125	332, 931	4, 527, 056	69.6	61.2
22	1967	2, 298, 725	345, 781	2, 644 506	3, 306, 011	5, 950, 517	1, 153, 141	7, 103, 658	90.5	55.6
23	1968	693, 319	(221, 871)	471, 448	3, 610, 446	4, 081, 894	001	4, 081, 895	106.5	88.5
24	1969	188, 067	187, 553	375, 620	5, 412, 571	5, 788, 191	626, 554	6, 414, 745	96.7	93.5
25	New supply additions: [2]									
26	1963									
27	1964	616, 074	373, 884	989, 958	428, 132	1, 418, 090		1, 418, 090	53.4	30.2
28	1965	1, 218, 987	386, 875	1, 605, 862	1, 965, 386	3, 571, 248	596, 106	4, 167, 354	83.6	55.0
29	1966	1, 814, 149	777, 983	2, 592, 132	1, 383, 448	3, 975, 580	510, 014	4, 485, 594	64.0	34.8
30	1967	2, 016, 381	284, 001	2, 300, 382	1, 772, 491	4, 072 873	408, 011	4, 430, 884	86.2	43.5
31	1968	345, 880	153, 064	498, 944	2, 291, 830	2, 790, 774		2, 790, 774	93.7	82.1
32	1969	316, 856	203, 742	520, 598	3, 990 516	4, 511, 114	673, 218	5, 184, 332	95.1	88.5

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[1] Yearend reserves plus annual production less previous yearend reserves.

[2] Also included in "annual revisions and additions," above.

[3] Warranty contracts not included.

Chart No. 1

SOUTHERN LOUISIANA AREA
TRENDS IN REMAINING RECOVERABLE GAS RESERVES
1963 TO 1969
(DATA FROM FPC FORM 15 REPORTS)

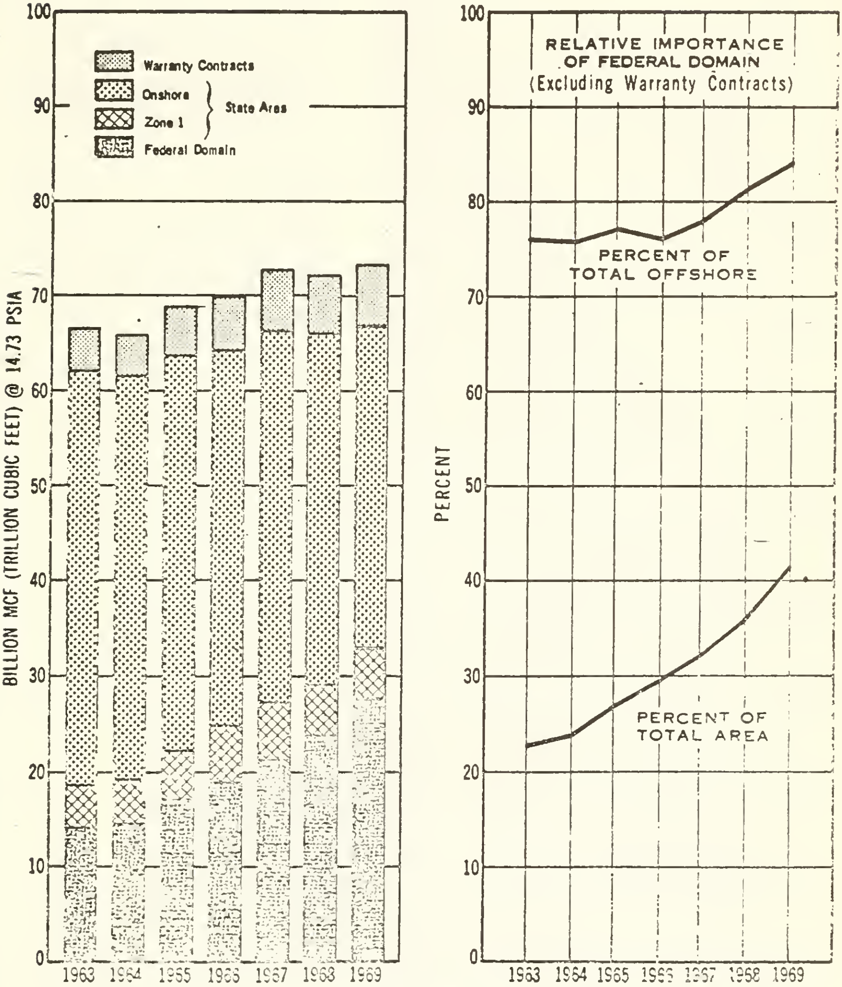


Chart No. 2

SOUTHERN LOUISIANA AREA

TRENDS IN ANNUAL GAS PRODUCTION 1963 TO 1969

(DATA FROM FPC FORM 15 REPORTS)

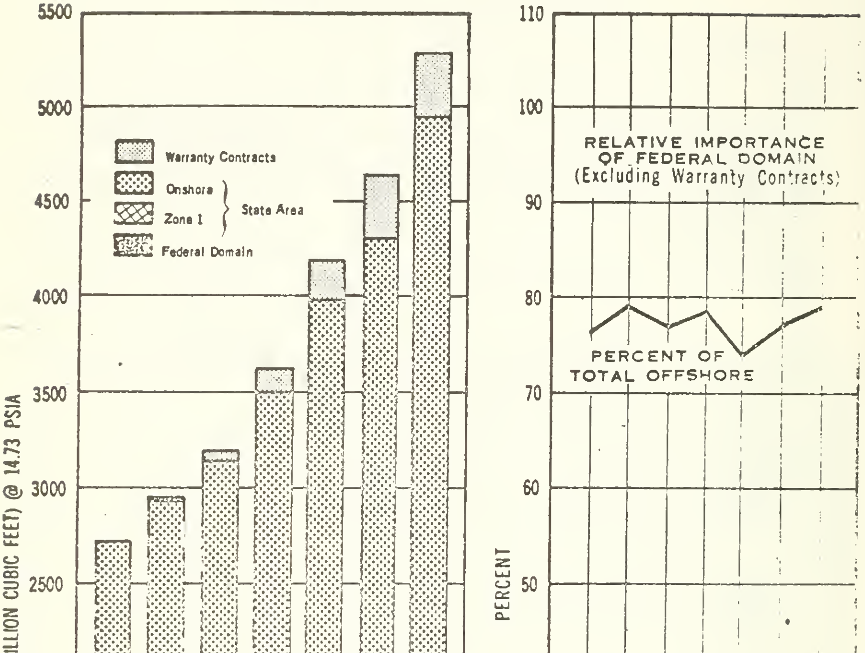


Chart No. 3

SOUTHERN LOUISIANA AREA

TRENDS IN ANNUAL REVISIONS AND ADDITIONS TO GAS RESERVES

1964 TO 1969

(DATA FROM FPC FORM 15 REPORTS)

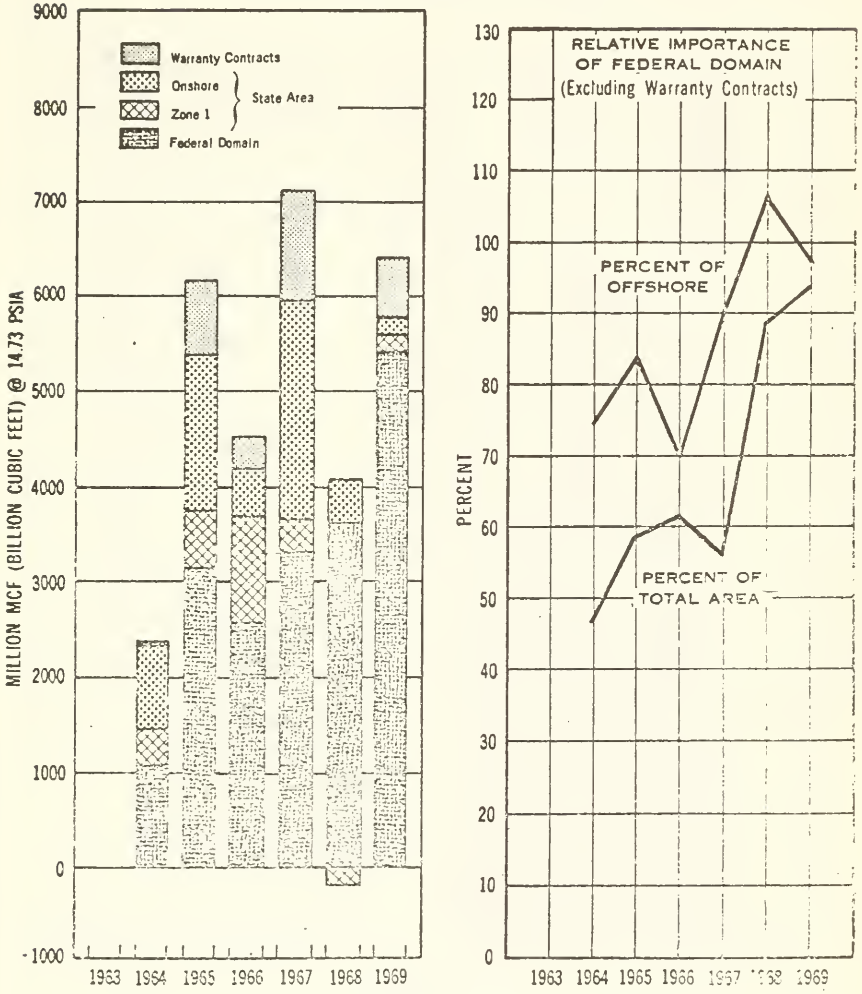
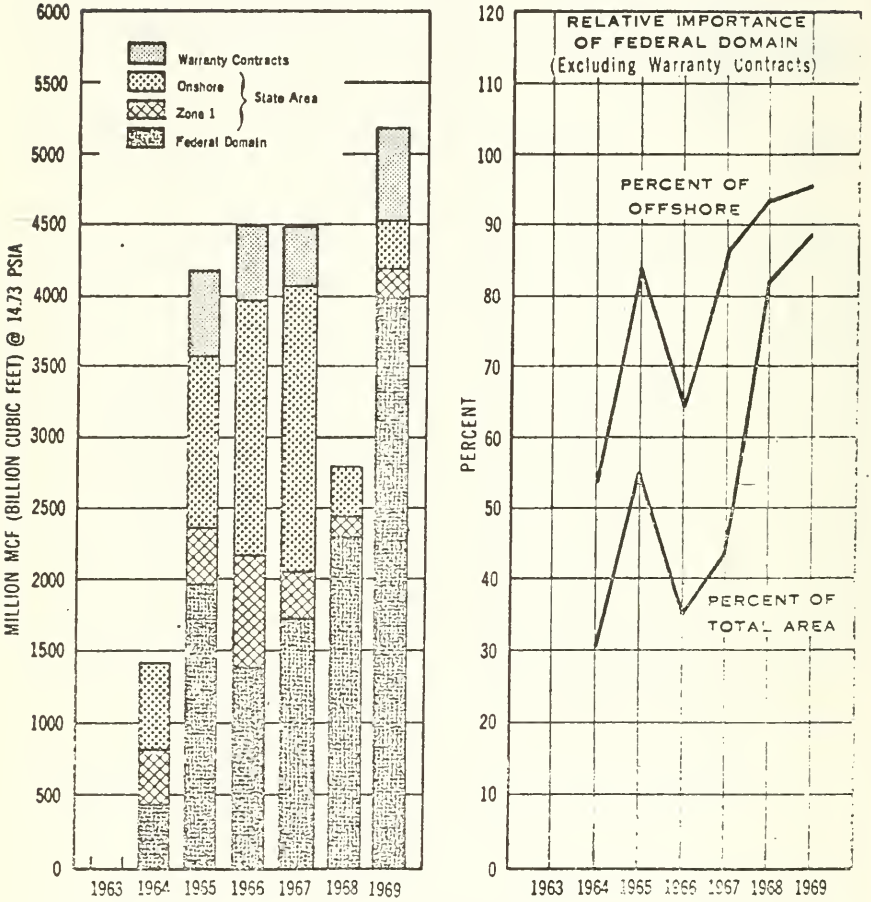


Chart No 4

SOUTHERN LOUISIANA AREA

TRENDS IN NEW GAS RESERVE ADDITIONS
1964 TO 1969

(DATA FROM FPC FORM 15 REPORTS)



SCHEDULE NO. 3

SOUTHERN LOUISIANA AREA GAS PRODUCTION FROM AVAILABLE RECOVERABLE GAS RESERVES, 1963 TO 1969, DATA FROM FPC FORM 15 REPORTS

[All volumes in MM ft ^{3} at 14.73 lb/in ^{2} a]

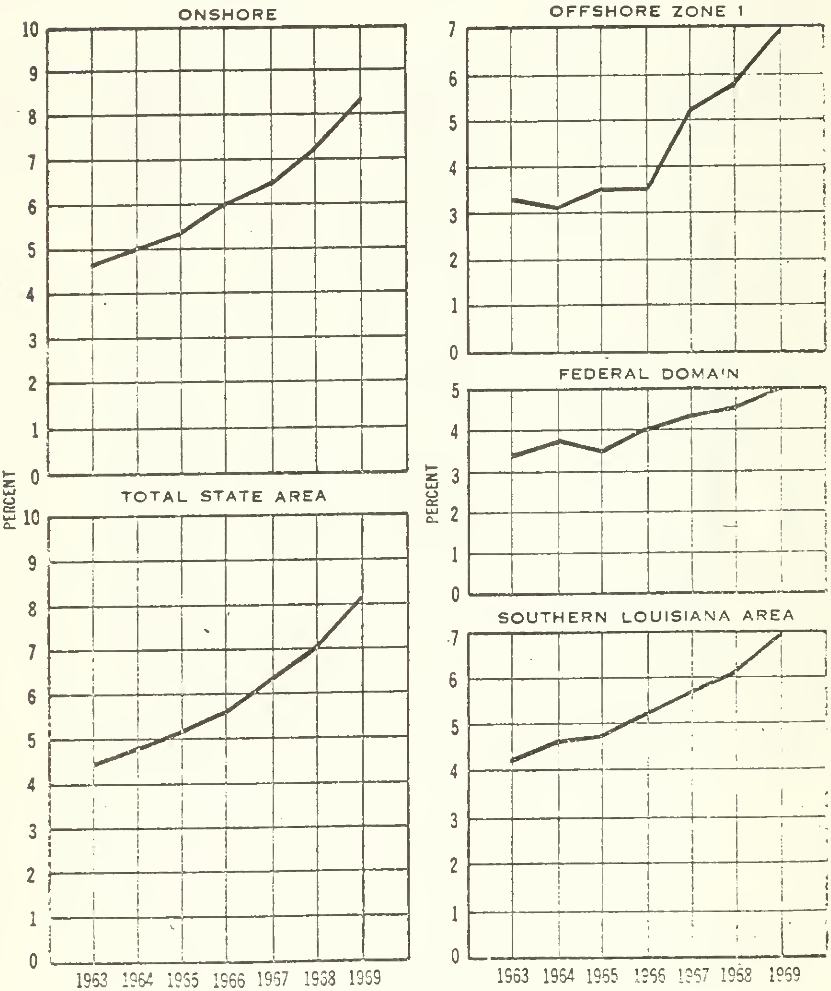
Line	Year (a)	Remaining reserves (b)	Annual production (c)	Total annual reserves (d)	Percent produced [1] (e)
1	Onshore				
2	1963	43,559,415	2,082,065	45,641,480	4.6
3	1964	42,201,342	2,234,855	44,436,197	5.0
4	1965	41,503,948	2,332,622	43,836,570	5.3
5	1966	39,502,368	2,503,191	42,005,559	6.0
6	1967	39,105,538	2,695,555	41,801,093	6.4
7	1968	36,944,246	2,854,611	39,798,857	7.2
8	1969	34,034,982	3,097,331	37,132,313	8.3
	Offshore zone 1:				
9	1963	4,452,301	152,193	4,604,494	3.3
10	1964	4,674,285	147,710	4,821,995	3.1
11	1965	5,095,395	185,614	5,281,009	3.5
12	1966	6,003,155	216,336	6,219,491	3.5
13	1967	6,013,176	335,760	6,348,936	5.3
14	1968	5,454,050	337,255	5,791,305	5.8
15	1969	5,254,425	387,178	5,641,603	6.9
	Total State area:				
16	1963	48,011,716	2,234,258	50,245,974	4.4
17	1964	46,875,627	2,382,565	49,258,192	4.8
18	1965	46,599,343	2,518,236	49,117,579	5.1
19	1966	45,505,523	2,719,527	48,225,050	5.6
20	1967	45,118,714	3,031,315	48,150,029	6.3
21	1968	42,398,296	3,191,866	45,590,162	7.0
22	1969	39,289,407	3,484,509	42,773,916	8.1
	Federal domain:				
23	1963	14,048,448	489,347	14,537,795	3.4
24	1964	14,570,795	556,706	15,127,501	3.7
25	1965	17,088,894	616,692	17,705,586	3.5
26	1966	18,868,044	789,268	19,657,312	4.0
27	1967	21,221,801	952,254	22,174,055	4.3
28	1968	23,710,877	1,121,370	24,832,247	4.5
29	1969	27,659,043	1,464,405	29,123,448	5.0
	Total southern Louisiana area:				
30	1963	62,060,164	2,723,605	64,783,769	4.2
31	1964	61,446,422	2,939,271	64,385,693	4.6
32	1965	63,688,237	3,134,928	66,823,165	4.7
33	1966	64,373,567	3,508,795	67,882,362	5.2
34	1967	66,340,515	3,983,569	70,324,084	5.7
35	1968	66,109,173	4,313,236	70,422,409	6.1
36	1969	66,948,450	4,948,914	71,897,364	6.9

[1] Column (c) divided by column (d)×100.

Note: Warranty contracts not included.

Chart No. 5

SOUTHERN LOUISIANA AREA
TRENDS OF ANNUAL GAS PRODUCTION FROM AVAILABLE RECOVERABLE GAS RESERVES
1963 TO 1969
(DATA FROM FPC FORM 15 REPORTS)



APPENDIX A

SUMMARY—REPORT OF UNCERTIFICATED GAS RESERVES CONTRACTED BY INTERSTATE PIPELINE. COMPANIES IN SOUTHERN LOUISIANA AREA, AS OF DEC. 31, 1969

[All volume in MM ft^3 at 14.73 lb/in^{2}a]

	Line and company	State area			Federal domain			Total southern Louisiana area		
		Non-associated (a)	Associated-dissolved (b)	Total (c)	Non-associated (d)	Associated-dissolved (e)	Total (f)	Non-associated (g)	Associated-dissolved (h)	Total (i)
1	Bluebonnet Gas Corp.[1]			None			None			None
2	Chandeleur Pipeline Co									
3	Coastal States Gas Prod.[1]			None			None			None
4	Columbia Gulf Transmission Co			None			None			None
5	Columbia Offshore Pipe Line Co			None	17, 328	0	17, 328	17, 328	0	17, 328
6	Consolidated Gas Supply Corp									
7	Delta Gas Inc.[1]			None			None			None
8	El Paso Natural Gas Co			None			None			None
9	Florida Gas Transmission Co			None			None			None
10	Humble Gas Transmission Co			None			None			None
11	Michigan Wisconsin Pipe Line Co			None			None			None
12	Natural Gas Pipe Line Co. of America									
13	Plaquemines Oil & Gas Co.[1]			None	699, 320	253, 148	952, 468	699, 320	253, 148	952, 468
14	Sea Robin Pipe Line Co									
15	South Texas Natural Gas Gathering Co.[1]			None			None			None
16	Southern Natural Gas Co			None						
	Tennessee Gas Pipeline Co.[2]			None			None			None
8	Texas Eastern Transmission Corp	28, 346	0	28, 346			None	28, 346	0	28, 346
9	Texas Gas Transmission Corp	30, 703	40, 231	70, 934	217, 891	17, 314	235, 205	248, 594	57, 545	306, 139
20	Transcontinental Gas Pipe Line Corp			None			None			None
21	Trunkline Gas Co			None			None			None
22	United Fuel Gas Co	6, 642	0	6, 642			None	6, 642	0	6, 642
23	United Gas Pipe Line Co									
4	Valley Gas Transmission, Inc.[1]									
	Totals	65, 691	40, 231	105, 922	934, 539	270, 462	1, 205, 001	1, 000, 230	310, 693	1, 310, 923

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[1] No prehearing exhibit No. 10 received for Dec. 31, 1969.

[2] Company contracted in December 1969 for the nonassociated gas underlying a 50-percent interest in a lease in the offshore Federal domain. Data to estimate gas reserves are not yet available to the company.

Before the Federal Power Commission

Docket Nos. AR61–2, *et al.* and AR69–1

RATE PROCEEDINGS (SOUTHERN LOUISIANA AREA)

ERRATA TO STAFF REPLY BRIEF

The following changes should be made in the reply brief submitted by the staff in these consolidated proceedings.

1. A footnote should be added immediately following the heading at the top of page 14 to read as follows:

"[1] The views expressed at pages 14–38 of this brief dealing with econometric issues are solely those of the Commission's Office of Economics."

2. The heading at the top of page 38 should be changed to read as follows: "VII. The Office of Economics' Conclusion: The Commission Should Use the Staff's Econometric Model."

3. A footnote should be added immediately following the heading at the top of page 39 to read as follows:

"[1] The views expressed at pages 39–41 of this brief dealing with the reliability of cost estimates are not the views of the Office of Economics."

4. A footnote should be added immediately following the heading at the top of page 42 to read as follows:

"[1] The views expressed at pages 42–48 of this brief dealing with new gas well gas cost issues are not the views of the Office of Economics."

Respectfully submitted.

RICHADR V. MATTINGLY, JR.,
Commission Staff Counsel.

FEDERAL POWER COMMISSION—ORDER GRANTING MOTION FOR OMISSION OF INTERMEDIATE DECISION PROCEDURE

Before Commissioners: John N. Nassikas, Chairman; Lawrence J. O'Connor, Jr., John A. Carver, Jr., and Albert B. Brooke, Jr.

Area Rate Proceedings (Southern Louisiana Area). Dockets Nos. AR61–2, *et al.* AR69–1.

(Issued March 15, 1971)

On February 4, 1971, the Commission's staff filed in these dockets a motion for omission of the intermediate decision procedure. The motion was reported to the Commission by the Presiding Examiner on March 5, 1971, following the filing of answers. Virtually all of the principal intervenors support the motion. The only objection was filed by the American Public Gas Association.

There is a clear need to bring these proceedings to a conclusion as quickly as possible. Reference to the procedural history of the proceedings will show that it has been almost 10 years since the original Southern Louisiana area rate proceeding was instituted. Gas consumers and producers both are entitled to the establishment of definite prices at the earliest possible date. The adequacy of current gas reserve inventories to meet the increasing requirements for service is a matter of increasing concern, and it is important that the Commission evaluate the evidence at the earliest practicable time. At the present time and until a decision is reached herein, the producer in Southern Louisiana does not know what the just and reasonable rate is for past sales, nor what the rate will be for future discoveries. This uncertainty as to both past and future rates can serve only to discourage exploration for new reserves. Such uncertainty can best be eliminated by the prompt rendering of a decision herein.

Reference is made in the motion to the procedural circumstances here involved. As a result of the court review proceedings in Docket Nos. AR61–2, *et al.*, the rates previously set by the Commission in Opinion Nos. 546 and 546A are subject to modification. By order issued December 24, 1970, the AR61–2 proceeding was reopened and consolidated with the second-round proceeding in Docket No. AR69–1. It would not be appropriate to require or even permit a further intermediate decision in Docket Nos. AR61–2, *et al.*, since such procedure would place the examiner in the position of reviewing the prior orders of the Commission. Nor is there any reason to require an examiner's decision in Docket No. AR69–1. In order to act on the issues in the reopened proceeding in Docket Nos. AR61–2, *et* al., the Commission must have before it not only the record in Docket

Nos. AR61–2, *et al.*, but also the record in Docket No. AR69–1. This serves to demonstrate the basic interrelationship and interdependence of the consolidated proceedings, and indicates clearly that the proceedings should not be severed for purposes of decision, intermediate or otherwise.

Finally it is noted that the parties are virtually unanimous in their support of the motion. The major common-interest group participants supporting the motion include the Associated Gas Distributors, The United Distribution Companies, the Pipeline Purchasers, the major producers respondents, and the Commission's staff. The only objecting party is the American Public Gas Association. However, the APGA in its answer to the motion sets forth no facts which would warrant requiring an intermediate decision in light of the substantive and procedural considerations discussed above. The motion for omission of the intermediate decision procedure will accordingly be granted.

The Commission finds:

That due and timely execution of its functions imperatively and unavoidably require that the intermediate decision procedure be omitted in these consolidated proceedings.

The Commission orders:

(*a*) The intermediate decision procedure in these consolidated proceedings shall be omitted.

(*b*) Oral argument before the Commission shall be omitted.

(*c*) Initial briefs shall be filed on or before April 15, 1971.

(*d*) Reply briefs shall be filed on or before May 6, 1971.

By the Commission.

KENNETH F. PLUMB, *Acting Secretary.*

Area Price Regulation in the Natural Gas Industry of Southern Louisiana †

William P. Diener *

Production of hydrocarbons in the fields of southern Louisiana is a matter of increasing interest, both locally and nationally. The oil and gas industry is the most important single economic factor in the State of Louisiana.

> The fact is that more than *$1 million in taxes and fees is generated for* [*this*] *State every day of the year—and this represents more than half of all the income which Louisiana realizes from any State source.* Furthermore, $2 million per day is invested in the cost of drilling and equipping oil and gas wells or drilling dry holes—the largest capital investment in Louisiana.[1]

Louisiana's production of natural gas is particularly important to the entire nation. *Southern Louisiana*, including the offshore areas, is *the leading natural gas source in the United States*, according for *about 33 percent of production and 30 percent of proved reserves.*[2] This article will focus on the producing segment of the natural gas industry in southern Louisiana and the area price regulations applicable to that segment.

Since 1954, when wellhead rates of "jurisdictional" sales of natural gas were first subjected to regulation,[3] the Federal Power Commission has generally held the line on price increases by the producers. This hard-line approach, utilizing traditional cost-of-service analysis while largely ignoring supply and demand, alternative investment opportunities, and prices of alternative fuels, has been a prime factor in the decline of exploration and developmental drilling and the resultant decline in the nation's inventory of gas reserves. Thus, the actual implementation of area price regulation has obtained a bargain fuel for the public.

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†The views expressed in this article are those of the author and not those of the Federal Trade Commission or any other governmental agency or commission.

*Member of the Indiana Bar; attorney, Bureau of Competition, Federal Trade Commission. B.A. 1964, Wabash College; J.D. 1968, Indiana University; LL.M. 1972, George Washington University.

[1] *Hearings on H.R. 6737 and H.R. 5757 Before the Subcomm. on Communications and Power of the House Comm. on Interstate and Foreign Commerce*, 90th Cong., 1st Sess. 11 (1967) (statement by Representative Hale Boggs).

[2] American Gas Ass'n, Reserves of Crude Oil, Natural Gas Liquids and Natural Gas in the U.S. and Canada (1970) (the statistics exclude Alaska).

[3] The Supreme Court held that jurisdictional sales of natural gas were subject to government rate regulation in Phillips Pet. Co. v. Wisconsin, 347 U.S. 672 (1954). Throughout this article the term "jurisdictional" sales will refer to sales of natural gas either in the interstate market or from federal lands. The term is a shorthand notation for the gas that has been subjected to FPC regulation.

We are now paying the price for this short sighted policy—the inability of pipelines to obtain sufficient supplies to meet consumer demands.

The debate over producer deregulation has been, and continues to be, a controversial issue. What are the consequences of an absence of produced rate regulation? This case study of the southern Louisiana area indicates that the lack of competition among producers could have adverse results. The Louisiana seller market is concentrated, with a high degree of accompanying bargaining power going to the large producers, the major oil companies. Entry barriers appear to be increasing, particularly barriers caused by rising exploration and development costs. Too many structural imperfections exist in the southern Louisiana natural gas producing industry to expect effective producer competition. Even assuming there was no regulation, antitrust laws could not, or would not, be enforced to remove these market imperfections. Thus, regulation of wellhead rates is necessary, however, a method more satisfactory than the early approaches to area pricing must be found and implemented. General knowledge of the economic and legal background of natural gas rate regulation is a prerequisite to understanding the producers faced in the recent Federal Power Commission proceedings to set producers' rates for southern Louisiana.

BACKGROUND

The natural gas industry may be divided into three distinct segments: production, transmission, and distribution. Transmission companies (pipelines) pipe gas from sources of supply to retail service areas where gas is wholesaled to local distributing utilities for resale to consumers. Since this article analyzes the production segments and the relations between producers and pipelines, that portion of the industry concerned with distribution will not be considered.

Domestically produced natural gas is supplied by about 4700 independent producers. There are 4630 small producers, those with annual jurisdictional sales of ten million Mcf (thousand cubic feet) or less. Small producers accounted for about ten percent of the total 1968 United States jurisdictional sales of natural gas.[4] Some 263 domestic producers and four foreign suppliers provided 92 percent of the interstate pipelines' requirements in 1968.[5] Twenty-four domestic producers supplied almost 70 percent of the gas purchased by interstate pipeline companies in the same year.[6] Thus, the term "independent producer" is more a word of art than a functionally descriptive term.

The major producers of natural gas are the oil companies. Since gas is often discovered or developed along with oil, and by similar technology, the role of the oil companies in natural gas production could reasonably have been anticipated. Of the 287.3 trillion cubic feet of total proved natural gas reserves at the end of 1968, eighteen major integrated petroleum companies controlled about 65 percent.[7] Approximately 37 percent of these reserves was controlled by four companies—Standard Oil of New Jersey, Standard Oil of Indiana, Gulf Oil Corporation, and Texaco.[8]

The transmission and distribution segments of the gas industry are themselves major industries. The natural gas pipeline and distributing industry ranked sixth in total gross investment in 1969.[9] Many of the transmission companies are integrated to varying degrees, some backward into producing (*e.g.*, Pennzoil United, Tenneco), some forward into distribution (*e.g.*, Columbia Gas System, Inc.), and almost all own some wells and reserves. The transmission segment of the natural gas industry is composed of large, heavily-capitalized firms. A successful gas system must be large; the system must provide dependable and adequate pipeline service, obtain preconstruction contracts to insure markets, own or control tremendous reserves, and so forth. "The technological integration of a natural gas system produces enormous pressures for economic integration: to make sure of success at any one level of operation it is advantageous to have some measure of control over the other two." [10] In describing the state of the industry in 1935, one commentator noted that the "producer had shared in the building of pipelines.

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[4] FPC Press Release No. 20.16904 (July 23, 1970).

[5] FPC, Sales by Producers of Natural Gas to Interstate Pipeline Companies, at 2 (1968).

[6] *Id.*

[7] Standard & Poor's Industry Surveys 57 (Dec. 11, 1969) (Oil).

[8] *Id.* In addition to oil and gas, the major oil companies currently control twenty percent of the United States coal production, probably a greater share of coal reserves, and an estimated 80 percent of uranium reserves. Business Week, Nov. 7, 1970, at 54; Oil & Gas J., Mar. 1, 1971, at 19.

[9] Standard & Poor's Industry Surveys 56 (July 30, 1970) (Utilities—Gas). The total gross investment was about $38 billion at the end of 1969.

[10] R. Huitt, Public Administration and Policy Formulation 56–57 (1958).

The pipeline interests had leased acreage and bought utilities. Utilities had joined pipeline ventures and had entered production."[11] Thus, it might prove advantageous for a producer to have some control over a pipeline, thereby assuring a captive customer for its natural gas, and accruing some cost benefits.[12] During periods of peak demand, these forces for integration would be even greater.

Many economists and lawyers have debated the rationale behind government regulation of the natural gas producer.[13] A concise statement of some major factors supporting regulation of producer rates has been presented by former Senator Paul H. Douglas. He argued that competition cannot effectively regulate the industry. The consumer, as a result of his investment in appliances and equipment, is a captive of the pipeline, and the pipeline a captive of the producer; the only true competition is between the pipeline companies. Senator Douglas noted that in reality there is no effective competition among the 8,000 producers; in fact, the "pipeline companies are tied to the giant producers in what amounts to a monopoly situation."[14] In 1954, 197 producers (3.5 percent of the 8,000) sold almost 90 percent of the natural gas retailed in interstate commerce.[15] "Also of major importance is the fact that 30 nontransporting producers and 16 utility companies own 61 percent of the nation's estimated proven gas reserves."[16] Therefore, he concluded that the industry's structure and behavior require governmental regulation.[17] Other economists have asserted that the production of natural gas is a competitive industry, characterized by low concentration.[18] They have recognized the possibility of market control by the producers; however, they persistently claim the industry is structurally competitive. Envisioning alternate sources of supply and alternative buyers, this school has discounted the anticompetitive impact of long-term reserve contracts, immobility of pipelines, and long time-lag between investment and production.[19]

Having assumed jurisdiction over the producers' rates in jurisdictional sales of natural gas, the Federal Power Commission embarked upon an area-wide price setting approach. In the 1960 *Phillips Petroleum Co.* decision, the Commission abandoned the traditional individual company cost-of-service approach for producers.[20] Also, in 1960 the Commission instituted its first proceeding to deter-

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[11] *Id.* at 57.

[12] The following integrated firms are seeking the advantages of control of other segments of the industry in southern Louisiana.

Controlled company	*Parent or controlling company*
Pipelines:	Tenneco.
Tennessee Pipeline	Columbia Gas System.
United Fuel Gas	Columbia Gas System.
Columbia Gulf Transmission	American Natural Gas Co.
Michigan-Wisconsin Pipe Line	Panhandle Eastern Pipeline.
Trunkline Gas	Pennzoil United.
United Gas Pipeline	Consolidated Natural Gas.
Consolidated Gas Supply	Florida Gas Co.
Florida Gas Transmission	Peoples Gas Co.
Natural Gas Pipeline Co	Houston Natural Gas Corp.
Valley Gas Transmission	
Producers:	
Humble Oil & Refining Co	Standard Oil of New Jersey.
Pan American Petroleum Corp. (name changed to Amoco Production Co.).	Standard Oil of Indiana.
Union Producing Co	Pennzoil United.
California Co	Standard Oil of California (Chevron).

Moody's Industrials and Public Utilities Manuals 1738–76 (1969).

[13] Champlin Oil & Refining Co., Doc. No. G–9277, at 458 (FPC 1969) (testimony of M. Adelman); Champlin Oil & Refining Co., 19 F.P.C. 198, 200 (1958); Champlin Oil & Refining Co., 18 F.P.C. 782 (1957); Douglas, *The Case for the Consumer of Natural Gas,* 44 Geo. L.J. 566 (1956); Kitch, *The Permian Basin Area Rate Cases and the Regulatory Determination of Price,* 116 U. Penn. L. Rev. 191 (1967); *cf.* Permian Basin Area Rate Cases, 390 U.S. 747, 795 n. 68 (1968). Although a substantial group advocates deregulation, the Supreme Court has ruled to the contrary. The rates of an independent producer of natural gas, one unaffiliated with but selling to interstate pipelines, were held to be within the purview of government rate regulation because the producer was engaged in the "sale in interstate commerce of natural gas for resale." Phillips Pet. Co. v. Wisconsin, 347 U.S. 672 (1954).

[14] Douglas, *supra* note 13, at 577.

[15] *Id.* at 584.

[16] *Id.* at 586.

[17] *Id.* at 605–06. The distribution segment is monopolistic, while the transmission segment approaches a monopoly. *Id.* at 576–78. The production segment is the least concentrated, an oligopoly with a small competitive fringe. *Id.* at 578–81.

[18] Champlin Oil & Refining Co., Doc. No. G–9277, at 458 (FPC 1969) (testimony of M. Adelman); Champlin Oil & Refining Co., 19 F.P.C. 198, 200 (1958); Champlin Oil & Refining Co., 18 F.P.C. 782 (1957).

[19] *See generally* P. MacAvoy, Price Formation in Natural Gas Fields (1952); Douglas, *supra* note 13.

[20] Phillips Pet. Co., 24 F.P.C. 537 (1960), *aff'd sub nom.*, Wisconsin v. FPC, 303 F. 2d 380 (D.C. Cir. 1961), *aff'd,* 373 U.S. 294 (1963). In 1960, the Commission published guideline rates for each area. Statement of General Policy No. 61–1, 24 F.P.C. 818 (1960).

mine just and reasonable rates under section 5(a) of the Natural Gas Act[21] for producers in the Permian Basin area of New Mexico and the Texas panhandle, and in 1961 began a similar proceeding for the southern Louisiana area, but did not issue its first area rate decision until 1965. In this ruling, the landmark *Permian Basin Area Rate Proceeding*,[22] the Commission decided that the area approach "offers a regulatory method which is best adapted to the discharge of our responsibilities for protecting natural gas consumers while providing the greatest incentive to producers to continue their search for needed additions to our gas supply."[23] Although the Supreme Court affirmed the Commission's reliance on costs to determine producer area rates in *Permian*, a large measure of latitude was left to the Commission. For instance, the Supreme Court did not prohibit consideration of field prices in future area rate proceedings,[24] and it recognized that cost calculations were imprecise[25] and acknowledged that noncost factors could be utilized in prescribing producer rates.[26] Generally, the Supreme Court indicated that the Commission could utilize a variety of regulatory methods, in addition to the one affirmed by the Court.[27]

The area ratemaking approach has been much criticized and an attempt to discuss all the criticism is not warranted. However, the analysis of one commentator is relevant. According to Edmund Kitch, the decision to impose price control on the field market was based upon two assumptions: (1) the supply of natural gas is unresponsive to price, and (2) price is an undesirable devise to use in allocating available gas between competing users.[28] In appraising the two-price system in area ratemaking, one price for new gas and one price for old and associated gas, Kitch concluded that part of the supply is responsive to price. Of course, the supply of associated gas is an inevitable by-product of oil production and will not be very responsive in the short run to gas prices. Likewise, the market for old gas is not really responsive to price because the producer is legally obligated to supply it. However, the market for new gas is very much responsive to price.[29] "The regulation creates a market in which the amount of gas demanded is in excess of the amount that would be demanded if purchasers were faced with prices based on the actual marginal cost of producing the gas."[30] Thus, the two-price system, coupled with the actual rates established, may have created an artificially exaggerated demand for gas. Hence, it is important that area prices accurately reflect long run costs of production.

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[21] 15 U.S.C. § 717d (1964).

[22] Permian Basin Area Rate Proceeding, 34 F.P.C. 159 (1965), *rev'd sub nom.*, Skelly Oil Co. v. FPC, 375 F. 2d 6 (10th Cir. 1967), *rev'd sub nom.*, Permian Basin Area Rate Cases, 390 U.S. 747 (1968).

[23] 34 F.P.C. at 180. The rationale and policy for the area rate approach had been outlined earlier in Phillips Pet. Co. v. Wisconsin, 373 U.S. 294 (1963). The Commission had stated that the "individual company cost-of-service method, based on theories of original cost and prudent investment, was not a workable or desirable method for determining the rates of independent producers and that the 'ultimate solution' lay in what has come to be known as the area rate approach. . . ." *Id.* at 298–99. The cost-of-service method was determined to be inadequate, since "unlike the business of a typical public utility, the business of producing natural gas involved no fixed, determinable relationship between investment and service to the public." *Id.* at 299. For the same rationale see Permian Basin Area Rate Cases, 390 U.S. 747, 756–57 (1968). Further, the Commission felt the area approach would avoid cost-allocation problems and be less of an administrative burden. 373 U.S. at 300.

[24] Permian Basin Area Rate Cases, 390 U.S. 747, 795 (1968).

[25] *Id.* at 761, 791, 804.

[26] *Id.* at 815 n. 98.

[27] *Id.* at 767. 772 n. 37, 800.

[28] Kitch, *Regulation of the Field Market for Natural Gas by the Federal Power Commission,* 11 J. Law & Econ. 243, 244–45 (1968). *See also* Kessel, *Economic Effects of Federal Regulation of Milk Markets*, 10 J. Law & Econ. 51 (1967).

[29] Kitch, *supra* note 13, at 192.

[30] Kitch, *supra* note 28, at 279.

> Thus the consumer of natural gas will face a price based upon the average cost of all gas—old [and] new. . . . Thus, to illustrate, the consumer may face a price based upon an average field price of 18 cents plus transportation charges of 60 cents, but acquisition of the supply necessary to satisfy his demand may cost a "new new" price of 26 cents. Since more consumers will be willing to pay 78 cents for the gas than 86 cents, the demand for the "new new" gas will be greater than is actually justified by its economic value to the ultimate consumers.

In establishing the dual prices for a particular pricing area, the FPC considers current nationwide costs in determining the price for new gas and actual historical area production costs in determining the price for old gas. Current nationwide costs include (1) exploration and development costs, including dry holes, production operating expense, net liquid credit, adjustment for exploration in excess of production, and other exploration costs, (2) depletion, depreciation, and amortization of production investment costs, (3) return on production investment, (4) return on working capital, (5) regulatory expense, (6) royalties, and (7) area gathering expense.[31] These nationwide costs are determined from a number of sources, including trade associations, producer questionnaires, the Chase Manhattan Bank's annual financial analysis of petroleum companies, and the United States Census Bureau. The price for old, flowing gas is determined from historical data on costs in the particular FPC production area. Such area costs would include (1) production costs (cash expense, depreciation, depletion, and a return allowance), (2) exploration and development expenses and return, (3) regulatory expenses, and (4) area gathering expenses.[32] The use of averages has been assailed since they do not consider the individual producer costs. For instance, costs vary from producer to producer depending upon gas pressure, absence of gas impurities, depth of the producing horizon, BTU content, and so forth.[33] In a competitive situation, each producer's gas reserves would command a price equal to its value to a pipeline; this is not the case where one price is set for both high and low value reserves. The Commission has determined that there is no need to offer a higher price for the old gas and the associated gas because the old gas is already committed to contract and the associated gas is relatively unresponsive to price;[34] however, a higher price is attached to new, non-associated gas because it is more responsive to prices. "[T]he two-price rate structure will both provide a useful incentive to exploration and prevent excessive producer profits."[35]

Further costs involved in regulating the industry are the costs occasioned by the very fact of regulation, costs that must be absorbed by the regulated industry. Costs of regulating the natural gas producer include administrative costs, delay on the contract price, and contingency costs. These costs have been estimated as seven percent of the base price, or a 1.164 cents per Mcf burden to the producers.[36] The overall cost of regulating gas field prices has been estimated as $33.1 million.[37]

Although there are costs, direct or indirect, in regulation, the absence of regulation may also impose costs. In 1969, 6.789 billion cubic feet of natural gas were produced in southern Louisiana.[38] During 1968, revenues to southern Louisiana producers were 19.84 cents per Mcf of jurisdictional sales.[39] Applying the 1968 revenue rates per Mcf to the 1969 production results in an approximate total revenue of $1.35 billion. Assuming prices would increase if field regulation were withdrawn from a noncompetitive market, revenues of $1.93 billion would accrue from a price of 20.84 cents per Mcf. Thus a $70 million increase in revenues to producers would be expected from a five percent hike in the average revenues per Mcf.[40] This higher price could be passed on throughout the system to the consumer or the revenues could be retained by the producer for future exploration and development. Such a revenue increase would be expected if the regulated price were artificially held below the true market price and the oligopoly pricing behavior of producers were exercised.

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[31] *See, e.g.,* Southern Louisiana Area Rate Proceeding, 40 F.P.C. 530, 589 (1968), *aff'd sub nom.,* Southern Louisiana Area Rate Cases v. FPC, 428 F. 2d 407 (5th Cir.), *cert. denied sub nom.,* Municipal Distributors Group v. FPC, 400 U.S. 950 (1970).

[32] 40 F.P.C. at 603.

[33] MacAvoy, *supra* note 19, at 24.

[34] Permian Basin Area Rate Proceeding, 34 F.P.C. 159, 188–89 (1965). The distinction between casinghead gas and gas-well gas has been recently eliminated. Southern Louisiana Area Rate Proceeding, Op. No. 598 (FPC, July 16, 1971), *appeal docket sub nom.,* Placid Oil Co. v. FPC, No. 2761 (5th Cir., Sept. 9, 1971); Texas Gulf Coast Area Rate Proceeding, Op. No. 595 (FPC, May 6, 1971), *appeal docketed sub nom.,* P.S.C.N.Y. v. FPC, No. 1828 (D.C. Cir., Oct. 18, 1971); Hugoton-Anadarko Area Rate Proceeding, 44 F.P.C. 761, 787 (1970), *appeal docketed,* No. 1036 (9th Cir., Jan. 7, 1971).

[35] Permian Basin Area Rate Cases, 390 U.S. 747, 798 (1968).

[36] The 1.164 cents per Mcf in costs may be further broken down to .039 cents for administration, .809 cents for delay, and .316 cents for contingencies. Gerwig, *Natural Gas Production: A Study of Costs of Regulation,* 5 J. Law & Econ. 69, 85 (1962), *cited in* Permian Basin Area Rate Cases, 390 U.S. 747, 786–87 n. 56 (1968). The cost from contract date to commencement of delivery is most important.

[37] The $33.1 million total is composed of $3.1 million cost to the FPC and $30.0 million cost to the producers. MacAvoy, *The Effectiveness of the Federal Power Commission,* 1 Bell J. Econ. & Management Science 271, 300 (1970). The $30 million cost to the producers represents direct expenses of certification and litigation and indirect expenses of delays in production. If prices are reduced, a supply shortage results and the consumer losses in output are estimated at $12 million and income distribution gains at $63 million. The net benefit in income redistribution would be $51 million.

Whether the production segment of the natural gas industry should be regulated and whether area ratemaking is the best regulatory procedure are largely moot questions. The Supreme Court has acquiesced in both instances.[41] However, one should note that the regulation of natural gas producers is different than the regulation of other industries. The usual public utility dedicates a certain amont of property to public service, incurs costs in rendering its service, cannot cease to render service or abandon service without the approval of the regulatory body, and is allowed a fair return on the rate base and a return of the costs incurred. The natural gas producer, on the other hand, incurs exploration and development costs, may curtail or cease his exploration and development activity at any time without FPC approval, and is not compelled to make further in-

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[38] The natural gas production for southern Louisiana for the period 1964–70, expressed in billion cubic feet units, was as follows:

	Natural gas production	Interstate pipeline production
1970	7,326	
1969	6,789	5,287
1968	6,003	4,649
1967	5,296	4,194
1966	4,624	3,623
1965	4,012	3,198
1964	3,506	2,949

The proved reserves and dedicated reserves for the same approximate period, expressed in billion cubic feet units, were:

	Total proved reserves	Dedicated reserves
1970	79,093	
1969	80,769	73,289
1968	83,393	72,162
1967	81,424	72,729
1966	78,613	69,820
1965	77,670	68,916

24 American Gas Ass'n, Reserves of Crude Oil, Natural Gas Liquids and Natural Gas in th U.S. and Canada (1970); FPC, The Gas Supplies of Interstate Natural Gas Pipeline Companies (1969).

The resulting reserve/production ratios are of interest, particularly when compared with the ratios for the nation in the same years.

	1964	1965	1966	1967	1968	1969	1970
Southern Louisiana	21.0	19.4	17.2	15.2	13.9	11.9	10.8
United States	18.2	17.5	16.4	15.8	14.6	12.9	11.7

24 American Gas Ass'n, Reserves of Crude Oil, Natural Gas Liquids and Natural Gas in the U.S. and Canada (1970); FPC, A Staff Report on National Gas Supply and Demand (Sept. 1969).

[39] FPC, *supra* note 5.

[40] The illustration assumes an inelastic demand for natural gas. (6,789 billion cubic feet × 19.84 cents per Mcf = $1.35 billion; 6,789 billion cubic feet × 20.84 cents per Mcf = $1.42 billion.)

[41] Permian Basin Area Rate Cases, 390 U.S. 747 (1968); Phillips Pet. Co. v. Wisconsin, 347 U.S. 672 (1954).

vestments, to seek further supplies, or to dedicate additional supplies to interstate commerce.[42] The gas producer needs no certification of public convenience and necessity for either drilling and other field operations or for sales, unless the sales are jurisdictional.[43] Thus, the production and gathering of natural gas is quite different from the traditional public utility concept. However, that difference has not deterred price regulation.

A CASE STUDY IN AREA PRICE REGULATION

With the preceding background information, this article will examine price regulation in a particular geographic area in the natural gas producing industry. Although the relevant geographic market is nationwide via the intricate maze of pipelines, a particular area is significant for the production segment of the industry.

FPC Production Area No. 5 is that portion of southern Louisiana lying south of the 31st parallel. The area covers about 54,000 square miles, almost equally divided between land and offshore waters of the Gulf of Mexico. "From a national standpoint, southern Louisiana is both the most important and most productive natural gas area in the entire nation." [44] The area accounted for about 40 percent of the gas sold in the interstate market in 1969 [45] and for almost 30 percent of the total reserve additions from 1956–66,[46] and has contributed 63 percent of the national net increase in natural gas production since 1964.[47] Estimated total revenues to producers in the area in 1968 were $1.2 billion.[48] The southern Louisiana area is a significant, yet uniquely separate, part of the industry.

Field price regulation and the role of the natural gas producer should be viewed within the parameters of the industry itself. Kaysen and Turner define market structure as "those stable features of the environment of a business firm which determine or condition the firm's [decisions]." [49] A structural concept of market power is defined as when "a firm can behave persistently in a manner different from the behavior that a competitive market would force on a firm, facing otherwise similar cost and demand conditions." [50] Richard Caves outlines, in decreasing order of importance, the main elements of market structure: concentration, product differentiation, barriers to entry, growth rate of market demand, price elasticity of market demand, and the ratio of fixed to variable costs in the short run.[51] This article deals primarily with concentration, while covering the other elements of market structure more generally.

Concentration

Approximately six trillion cubic feet of natural gas were produced in southern Louisiana in 1968. In excess of 20 percent of this production went to the intrastate market.[52] The remaining 4.7 trillion cubic feet were jurisdictional, either

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[46] 40 F.P.C. at 637 n. 74.

[47] 23 American Gas Ass'n. Reserves of Crude Oil, Natural Gas Liquids and Natural Gas in the U.S. and Canada (1969).

[48] FPC, *supra* note 5 (rough estimates by author). *See* notes 33–35 *supra.*

[49] C. Kaysen & D. Turner, Antitrust Policy 71 (1959).

[50] *Id.* at 75.

[51] R. Caves. American Industry: Structure, Conduct, and Performance 16 (1967). *See also* J. Bain, Industrial Organization (1959).

[42] Southern Louisiana Area Rate Proceeding. 40 F.P.C. 530, 616–18 (1968). Of course, once gas is dedicated to interstate commerce, it may not be abandoned without FPC approval. 15 U.S.C. § 717f(b) (1963).

[43] Johnson. *Producer Rate Regulation in Natural Gas Certification Proceedings: CATCO in Context,* 62 Colum. L. Rev. 773, 774 (1962).

[44] 40 F.P.C. at 546.

[45] FPC, *supra* note 5.

[52] The intrastate market in natural gas for southern Louisiana during the period 1964–68 is set out below. The volume figures are expressed in billion cubic feet units.

	Total production	Louisiana gas sold intrastate		Natural gas used in Louisiana
		Percentage	Volume	
1968	6,003	22.7	1,363	1,366
1967	5,296	21.9	1,160	1,208
1966	4,624	20.7	957	1,068
1965	4,012	20.2	810	904
1964	3,506	16.1	564	870

24 American Gas Ass'n, Reserves of Crude Oil, Natural Gas Liquids and Natural Gas in the U.S. and Canada (1970) (total production); FPC, A Staff Report on the National Gas Supply and Demand, Table 21 (Sept. 1969) (Louisiana gas sold intrastate); 3 Denver Research Institute, Future Natural Gas Requirements of the United States (1969).

going into the interstate market or coming from federal lands.[53] Data on the intrastate market is not readily accessible; therefore, most of the information gathered is prepared from submissions by producers and pipelines to the Federal Power Commission.

Seller concentration is greater in the southern Louisiana area than in the United States as a whole. The top four producers in the United States accounted for 24.3 percent of the total national sales to interstate pipelines in 1968; the top eight accounted for 38.9 percent.[54] In southern Louisiana, the top four accounted for 34.5 percent; the top eight, 53.3 percent.[55] These concentration figures relate only to sales by producers. Paul MacAvoy obtained information on the concentration of "Gulf of Reserves" dedicated by the producers in southern Louisiana for the periods 1950–53 and 1951–54. During the 1950–53 period there were 49 sellers who dedicated new reserves under 83 contracts. The four largest producers dedicated about 46 percent of the reserves; the top ten almost 80 percent.[56] The concentration figures for the 1951–54 period are basically the same, although there were 54 sellers and 93 contracts. Seller concentration data in the intrastate market is not readily available. The 182 billion cubic feet of intrastate gas sold to interstate pipelines in southern Louisiana represent about thirteen percent of the area's estimated instrastate volume.[57] Almost three-fourths of the 182 billion cubic

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[53] All sales from the offshore areas are by definition jurisdictional. The Natural Gas Act defines interstate commerce as "commerce between any point in a State and any point outside thereof, or between points within the same State but through any place outside thereof. . . ." 15 U.S.C. § 717(a)(7) (1964). For the continuing controversy concerning state-federal jurisdiction over the submerged offshore areas, see United States v. Louisiana, 394 U.S. 11 (1969); United States v. Louisiana, 382 U.S. 288 (1965); United States v. Louisiana, 394 U.S. 502 (1960); United States v. Louisiana, 363 U.S. 1 (1960).

[54] FPC, *supra* note 5.

[55] The sales by southern Louisiana producers to interstate pipelines in 1968 were:

Producer	Volume (million cubic feet units)	Percentage of total
Humble Oil & Refining Co	485,938	10.4
Gulf Oil Corp	485,580	10.4
Union Oil Co. of California	350,650	7.5
Shell Oil Co	291,205	6.2
Total, top 4	1,613,373	34.5
Texaco, Inc	276,822	5.9
Continental Oil Co	239,445	5.1
Superior Oil Co	202,171	4.3
Mobil Oil Corp	161,929	3.5
Total, top 8	2,493,740	53.3
Total area sales	4,675,935	100.0

FPC, Sales by Producers of Natural Gas to Interstate Pipeline Companies (1968). The percentage of sales controlled by the top producers did not change much between 1967 and 1968. Compare with the above the figures for 1967: The total area sales amounted to 4,162,846 million cubic feet. The top four producers in sales were Humble Oil & Refining Co., Gulf Oil Co., Union Oil Co. of California, and Texaco, Inc., combining for a sales volume of 1,437,295 million cubic feet or 34.5 percent of the total for that year. Shell Oil Co., Superior Oil Co., Continental Oil Co., and Mobil Oil Corp. completed the top eight for 1967. The top eight accounted for 2,220,881 million cubic feet or 53.4 percent of the total. FPC Sales by Producers of Natural Gas to Interstate Pipeline Companies (1967).

[56] MacAvoy, *supra* note 19, at 174, Table 6:6.

[57] The following figures represent the 1968 intrastate sales by major producers to interstate pipelines in southern Louisiana. A major producer is one with annual sales of 2 million Mcf or more.

Producer	Volume (million cubic feet units)	Percentage of total
Texaco, Inc	45,239	24.8
Humble Oil & Refining Co	35,240	19.3
Gulf Oil Corp	34,224	18.8
Union Producing Co	18,485	10.2
Total, top 4	133,188	73.1
Getty Oil Co	8,432	4.6
California Co	7,041	3.9
Forest Oil Corp	6,194	3.4
Pan American Petroleum Corp. (Amoco Production Co.)	4,777	2.6
Total, top 8	159,632	87.6
Total intrastate	182,133	100.0

feet was sold by four producers, three of whom are among the top eight in the jurisdictional segment. *Moreover, all the intrastate sales of the major producers to interstate pipelines were directed toward one purchaser, United Gas Pipeline, which in turn is controlled by Pennzoil United.*

Buyer concentration is significantly greater than seller concentration in southern Louisiana. Approximately 61 percent of the interstate production of natural gas is accounted for by four pipelines, while the top eight represent almost 90 percent of production.[58] Of the 83 trillion cubic feet of proved reserves in 1968, 72 trillion cubic feet, or about 87 percent, were dedicated to interstate pipeline companies.[59] Within these dedicated reserves, four pipelines own about 57 percent and eight own about 89 percent.[60] MacAvoy's study indicated that in 1950–52 the four largest buyers purchased about 92 percent of the reserves.[61]

As was mentioned earlier, there is some evidence to indicate that industry costs require a successful firm to be large.[62] Although one can still envision a need and a place for the small entrepreneur in the exploration for natural gas (wildcatting), to a large extent the need is a myth rather than a reality. There has

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FPC, Sales by Producers of Natural Gas to Interstate Pipeline Companies, Table 4 (1968).

Compare the figures for 1967, noting that although the producers comprising the top eight change relative positions from 1967 to 1968, the total percentage for the two years remained 87.6 percent.

Producer	Volume (million cubic feet units)	Percentage of total
Gulf Oil Corp	35,952	21.2
Humble Oil & Refining Co	33,901	20.0
Texaco, Inc	28,757	16.9
Union Producing Co	19,405	11.4
Total, top 4	118,015	69.5
Pan American Petroleum Corp. (Amoco Production Co.)	13,737	8.1
Forest Oil Corp	6,636	3.9
Getty Oil Co	5,431	3.2
Louis J. Roussel	4,966	2.9
Total, top 8	148,785	87.6
Total intrastate	169,828	100.0

FPC, Sales by Producers of Natural Gas to Interstate Pipeline Companies, Table 4 (1967).

[58] Compare the interstate buyer concentration figures for 1967 and 1968 for southern Louisiana:

Pipeline	Production (million cubic feet units)		Percentage of total	
	1967	1968	1967	1968
United Gas Pipeline	864,034	959,313	20.6	20.6
Tennessee Pipeline	761,040	840,832	18.1	18.1
Transcontinental Gas Pipe Line	500,547	568,185	11.9	12.2
United Fuel Gas	433,550	448,407	10.4	9.7
Total, top 4	2,559,171	2,816,737	61.0	60.6
Southern Natural Gas	368,765	367,459	8.8	7.9
Texas Gas Transmission	329,219	365,386	7.9	7.9
Michigan-Wisconsin Pipeline	273,464	291,452	6.5	7.0
Texas Eastern Transmission	238,175	325,548	5.7	6.2
Total, top 8	3,768,794	4,166,582	89.9	89.6
Total area interstate	4,193,544	4,648,768	100.0	100.0

FPC, The Gas Suppliers of Interstate Natural Gas Pipeline Companies (1968); FPC, The Gas Suppliers of Interstate Natural Gas Pipeline Companies (1967).

[59] For the volume of dedicated reserves and the reserve/production ratios for the period 1964–70, see note 38 *supra*.

[60] The top four pipelines based on ownership of dedicated gas reserves in 1967 and 1968 were Tennessee Pipeline, United Gas Pipeline, United Fuel Gas, and Transcontinental Gas Pipeline. Completing the top eight were Texas Eastern Transmission, Southern Natural Gas, Texas Gas Transmission, and Michigan-Wisconsin Pipeline. The percentage figures stated in the text did not change significantly from 1967 to 1968. FPC, The Gas Suppliers of Interstate Natural Gas Pipeline Companies (1968); FPC, The Gas Suppliers of Interstate Natural Gas Pipeline Companies (1967).

[61] MacAvoy, *supra* note 19, at 170, Table 6:5.

[62] Huitt, *supra* note 10.

been a rising attrition rate among small producers. Industry association measures indicate that more than 25 percent of the small producers have disappeared from the market over the last ten years.[63] Even though the small producers may still outnumber the large producers,[64] there is a marked disparity in their influence since eight large, integrated petroleum companies control over half the supply of natural gas in southern Louisiana.

The term "structural oligopoly" describes a market "in which the few largest sellers in the market have a share of the market sufficient to make it likely that they will recognize the interaction of their own behavior and their rival's response in determining the values of the market's variables." [65] Many indices are considered in determining whether a particular market structure is an oligopoly. Kaysen and Turner begin testing for an oligopoly by requiring that the eight largest firms share one-third of the market. They then delineate two types of structural oligopoly. Type I occurs when the top eight firms have 50 percent of the market and the top twenty firms have 75 percent. Type II occurs when the top eight control one-third of the market and the remaining two-thirds is highly fragmented. In southern Louisiana, the top eight firms have over 50 percent of the market and the top twenty control about 71 percent of the interstate sales. Applying the Kaysen and Turner classification, the southern Louisiana market would be denominated a Type I loose oligopoly, since no one firm has more than a fifteen percent share and there is a fringe of small firms that may act as a competitive restraint.[66]

Buyer concentration, however, is much higher than seller concentration. In fact, in southern Louisiana the top eight pipelines control about 90 percent of the production in the interstate market and about 89 percent of the reserves dedicated to interstate pipelines. By comparison, the twenty largest pipelines control 90 percent of the national interstate pipeline production. Therefore, buyer concentration in southern Louisiana can be characterized as a tight oligopoly.[67]

In summary, seller and buyer concentration figures are higher in southern Louisiana than they are on a national level. Both the production and pipeline segments of the industry in southern Louisiana can be classified as structural oligopolies.

Other Factors

In examining the market structure of a particular industry, there are several other factors that merit attention. Product differentiation is, for all practical purposes, not germane to the natural gas industry. Although there may be minor quality differentials, natural gas is basically a homogeneous commodity. Barriers to entry are probably lower in the producing segment of the natural gas industry than in most manufacturing industries.[68] Capital requirements are relatively modest by comparison, although drilling equipment and outlays in the offshore areas are becoming increasingly expensive.[69] There are no apparent economies of scale in discovering and producing natural gas.[70] However, there probably is an advantage to the larger concern that can afford to spread the risks by drilling many wells. Indeed, from the risk standpoint, there may be definite economies of scale if it is recognized that risk, though not an obstacle to entry, may be inversely related to size.

Thus, product differentiation is inapplicable to the natural gas producing industry. Most of the gas produced in southern Louisiana is high pressure, sweet gas, which is delivered to the pipelines at or beyond a central point in the field; in essence, the gas is a commodity fuel. Barriers to entry are probably lower in this industry than in most manufacturing industries. Although these other factors should not be ignored, market concentration is the most influential feature of the southern Louisiana market.

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[63] FPC New Orleans Hearing, No. R–389A, at 55 (Aug. 10, 1970) (testimony of James C. Templeton): Initial Rates for Future Sales of Natural Gas, Doc. No. R–389A, 35 Fed. Reg. 11638 (1970).

[64] *See* note 4 *supra* and accompanying text.

[65] Kaysen & Turner, *supra* note 49, ch. II.

[66] *Id.* ch. III.

[67] *Id.*

[68] *Structure of the Natural Gas Producing Industry.* Address by Clark A. Hawkins, Seminar on Regulation of the Natural Gas Producing Industry, Washington, D.C., Oct. 15, 1970. Petroleum refining, on the other hand, does have substantial entry barriers. M. deChazeau & A. Kahn, Integration and Competition in the Petroleum Industry 18 (1959).

[69] Clark, *supra* note 68.

[70] *Id.*

Pricing of Natural Gas

The purpose of measuring concentration is to predict the extent that price will depart from the competitive price level.[71] The price ceiling for jurisdictional gas is established by the Federal Power Commission; prices for gas in the intrastate market are unregulated and are only controlled by the market mechanisms.

For a variety of reasons, the intrastate market has remained more attractive than the interstate market.[72] Generally, as long as there are adequate supplies for both markets, the intrastate purchaser can obtain a price concession reflecting the benefits to the producer from an unregulated sale.[73] For instance, the producer faces a degree of rate uncertainty in making a regulated sale. This is particularly important in southern Louisiana where close to 80 percent of the production is jurisdictional. Jurisdictional sales of gas have commanded premium prices since 1954.[74] However, intrastate prices on new contracts in 1970 exceeded the interstate prices for the first time. The higher intrastate prices might indicate a new desire on the part of the producers to sell in the intrastate market, outside governmental price regulation. On the other hand, higher intrastate prices may reflect a short term, though perhaps persistent, scarcity in uncommitted gas available for intrastate sales.

Average wellhead revenue per Mcf increased nationally by about seventeen percent in the period 1960–68, compared to an eleven percent increase in southern Louisiana for the same period.[75] During the 1960–68 period, the Wholesale Price Index increased about eight percent, and the Consumer Price Index was up eighteen percent. However, during the 1964–68 period, average wellhead revenues exhibited a modest decline in Louisiana but increased about six and one-half percent nationwide. The Wholesale Index was up about eight percent during 1964–68; the Consumer Price Index increased about twelve percent. Generally, wellhead prices for natural gas have followed the rise in consumer prices, except in the last few years. Louisiana field prices, on the other hand, have largely been stabilized since 1961. The leveling of wellhead prices in

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[71] G. Stigler, The Organization of Industry 30 (1968).

[72] Permian Basin Area Rate Cases, 390 U.S. 747, 799 n. 74 (1968).

[73] Generally, the major demand for natural gas from southern Louisiana is from the pipelines supplying distributors in the Middle West and Northeast.

[74] Note the price difference between intrastate and jurisdictional gas contracts in southern Louisiana for the years 1966–70. The figures are for the first half of each year only and represent contracts by producers with ten million Mcf or more in sales.

	Intrastate		Jurisdictional	
	Annual volume (millions of cubic feet)	Weighted average contract rate (cents per million cubic feet)	Annual volume (millions of cubic feet)	Weighted average contract rate (cent) per million cubic fects
State taxing jursidiction:				
1970	72,028,165	22.98	11,345,634	21.75
1969	10,438,812	19.34	83,175,000	21.26
1968	59,594,990	20.21	58,753,289	20.88
1967	21,178,226	19.49	139,862,464	21.05
1966	55,343,591	19.38	136,196,976	20.07
Federal domain:				
1970			22,827,818	21.87
1969			194,064,600	21.06
1968			115,819,308	20.76
1967			163,233,115	19.73
1966			94,120,567	19.21

Reply of the FPC staff, Bureau of Natural Gas, Initial Rates for Future Sales of Natural Gas, Doc. No. R–389A, 35 Fed. Reg. 11638 (Oct. 1, 1970).

[75] Southern Louisiana Area Rates, 40 F.P.C. 703, 781 (1966). Although State of Louisiana prices are used, southern Louisiana accounts for over four-fifths of the state's gas output. In terms of jurisdictional sales, southern Louisiana accounts for about 94 percent of the state's gas sales. FPC, *supra* note 4.

The following figures show the relative increases in the value of well head gas in

Louisiana might be the result of several factors, including FPC price control.[76]

The area prices set for southern Louisiana by the FPC were recently affirmed by the Fifth Circuit: [77]

However, these rates were stayed by Commission and court orders and were never implemented.[78] The Fifth Circuit, although affirming the Commission's rates, indicated that the Commission was free to make retrospective as well as prospective changes.[79] On July 16, 1971, the Commission, in accepting a settlement proposal, determined new area rates of 26 cents per Mcf for contracts dated on or after October 1, 1968, and 22.375 cents per Mcf for contracts prior to that date.[80]

Prior to FPC regulation, gas prices in southern Louisiana were far from stable. Through 1950, the unregulated price of gas did not exceed nine cents per Mcf. Prices increased substantially thereafter, and in 1958 the price spiral peaked when Trunkline contracted for gas at 24.05 cents per Mcf.[81] Average wellhead revenue per Mcf increased 158.3 percent for the United States in the period 1947–62; over the same period the increase was 447.2 percent in southern Louisiana.[82] Until 1950, there was only one major pipeline purchaser in the area, United Gas Pipeline. Through the pipeline's exercise of monopsony power, one should expect a wellhead price below competitive levels and an artificially high transmission price. The entrance of additional pipelines in the 1950's broke down this monopsony. By 1955 there were seven transmission companies with overlapping supply areas. The new transporters had disrupting effects upon the previously noncompetitive buying practices, with a resulting increase in wellhead prices. In addition, extensive demand for gas also contributed to the price increase.[83] More-

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Louisiana and the United States, the Wholesale Price Index, and the Consumer Price Index for the period 1950–68.

	Average value of natural gas at wellhead (cents per million cubic feet)		Price indexes (base years, 1957–59)	
	Louisiana	United States	Wholesale (all commodities)	Consumer (all commodities)
1968	18.9	16.4	108.7	121.2
1967	18.5	16.0	106.1	116.3
1966	18.3	15.7	105.9	113.1
1965	18.2	15.6	102.5	109.9
1964	19.1	15.4	100.5	108.1
1963	19.8	15.8	100.3	106.7
1962	19.7	15.5	100.6	105.4
1961	18.7	15.1	100.3	104.2
1960	17.1	14.0	100.7	103.1
1959	15.4	12.9		
1958	12.9	11.9		
1957	11.2	11.3		
1956	11.4	10.8		
1955	11.3	10.4	93.2	93.3
1950	5.3	6.5	86.8	83.8

U.S. Bureau of Mines, Mineral Yearbook (1950–68); Dep't of Labor, Bureau of Labor Statistics, Price Indices (1950–68).

[76] Kitch, *supra* note 28, at 265–70.

[77] Southern Louisiana Area Rate Cases v. FPC, 428 F.2d 407 (5th Cir. 1970).

	Cents per million cubic feet	
	Onshore	Offshore
Contracts after Oct. 1, 19 8	20.0	18.5
Contracts dated Jan. 1, 1961, to Oct. 1, 1968	19.5	18.0
Contracts before 1961 and casinghead gas	18.5	17.0

[78] FPC Order of Dec. 24, 1970. *In re* Southern Louisiana Area Rate Cases, 444 F.2d 125 (5th Cir. 1971); FPC Order of July 2, 1970, *In re* Southern Louisiana Area Rate Cases, 444 F.2d 125 (5th Cir. 1971); FPC Order of May 29. 1969, Southern Louisiana Area Rate Cases v. FPC, 428 F.2d 407 (5th Cir. 1970); Court Order of May 13, 1969, Southern Louisiana Area Rate Cases v. FPC, 428 F.2d 407 (5th Cir. 1970).

[79] *In re* Southern Louisiana Area Rate Cases, 444 F.2d 125, 126 (5th Cir. 1970).

[80] Southern Louisiana Area Rate Proceeding. Op. No. 598 (FPC, July 16. 1971), *appeal docketed sub nom.*, Placid Oil Co. v. FPC, No. 71–2761 (5th Cir., Sept. 9, 1971).

[81] 40 F.P.C. at 553.

[82] Southern Louisiana Area Rates, 40 F.P.C. 703, 753 (1966).

[83] MacAvoy, *supra* note 19, at 206.

over, although the price spiral was a result of the change in buyer structure and the strong demand for gas, producer contracts accentuated the increased prices. With the entry of alternative pipelines, a few sellers were supplying a few buyers in southern Louisiana. Under such a bilateral oligopoly, price and output are normally determined by bargaining because there is an absence of impersonal market forces.[84] In a bilateral oligopoly, there may be either balanced power, buyer dominance, or seller dominance. "The scales are fairly strongly tipped in favor of the buyers . . . since each of them can act independently to drive a hard bargain as he seeks supply, whereas to resist this pressure the sellers must have effective collusion over price and maintain it under duress." [85] Whether the producers can exert such power must be viewed in light of the pipelines' bargaining position and the demand for natural gas.

The producers presented evidence in *Southern Louisiana Area Rate Proceeding* [86] to prove the producing industry competitive. The major producer group relied on the testimony of Dr. James W. McKie.[87] Dr. McKie used three criteria to analyze the industry. He found that the top four producers accounted for 29 percent of the total interstate deliveries of gas in 1960–61; the top eight, about 50 percent. He compared concentration ratios with those published by the Bureau of Census. Well over half of 1,000 product classes had higher concentration ratios.[88] McKie next observed the turnover of leading firms, noting that with respect to the top ten suppliers in 1961 under contracts signed from 1957–1960, no supplier appeared among the top four in all four contract years.[89] Finally, he ascertained that there were low barriers to entry. New entrants accounted for seven percent of the volume of natural gas delivered in 1961, under contracts signd between 1957 and 1959.[90] "[E]ven though each individual new entrant may account for a small percentage of available supplies, the fact that firms enter the market in considerable numbers is an additional indicator of effective competition." [91] McKie's conclusions were an absence of concentration in producer control over supply and reasonably effective competition on the supply side.

The Hearing Examiner considered McKie's testimony; however, he reached an opposite conclusion based largely upon the Commission's reasoning in *Permian Basin Area Rate Proceeding.*[92] The Commission indicated in this first area rate proceeding that

> [t]here are admittedly many producers selling gas to the interstate pipelines . . . but nothing in this record suggests that any competition among them in making sales to the pipelines is in any way adequate to assure that the public will secure gas at just and reasonable prices in the absence of regulation.[93]

The Commission must look behind the price negotiated by the producers with the pipelines. The "supply of gas controlled by the producers was so restricted in relation to demand that they have economic power to bargain for prices that will be injurious to the public." [94] Furthermore, individual states influence the available supply of gas. The Louisiana Department of Conservation can prohibit the production of gas which exceeds the market demands.[95] The Commissioner of Conservation can likewise determine the allowable production of gas among fields.[96] Generally, these state regulations seek to prohibit misuse of a wasting resource, particularly when supply exceeds demand, a situation not encountered in the last several years.[97]

In making his determination the Examiner recognized the transmission companies' weak bargaining position in relation to the producers. The pipelines have to contract for large blocks of uncommitted reserves at increasing prices. Only a few producers have the large volumes required by the pipelines. The pipeline is willing to pay these higher prices since it can pass the increase on through its regulated cost-based resale rates. In addition, many pipelines are themselves producers with an interest in generally higher producer prices.[98]

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[84] J. Bain, Price Theory 394–96 (1966). *See also* J. McKie, Tin Cans and Tin Plate, A Study of Competition in Two Related Markets 25 (1959).

[85] Bain, *supra* note 84, at 395. *See also id.* at 332–39. Where there is a lack of product differentiation, as in natural gas, all rival prices tend to be identical. Likewise, since the product is not differentiated, there is a lack of advertising and sales promotion. Rivalry revolves around price and agreements to eliminate price cutting tend to become important.

[86] 40 F.P.C. 703 (1966).

[87] Visiting Professor of Economics, University of California, Berkeley.

[88] 40 F.P.C. at 710–11.

[89] *Id.* at 711.

[90] *Id.* at 711–12.

[91] *Id.*

[92] 34 F.P.C. 159 (1965).

[93] *Id.* at 181.

[94] United Gas Improvement Co. v. FPC, 290 F. 2d 133, 135 (5th Cir.), *cert. denied sub nom.*, Sun Oil v. United Gas Improvement Co., 368 U.S. 823 (1961).

[95] La. R.S. 30 : 41 (1950).

[96] La. R.S. 30 : 11 (1950).

[97] Many states control the quantity of production (proration) by regulating allowables (level of production) and the division of production (ratability). *See* A. Leeston, J. Crichton, & J. Jacobs, The Dynamic Natural Gas Industry 26–45 (1963).

The Examiner felt the key to determining the strength of effective competition was the amount of uncommitted reserves controlled by the large producers. "Here, as in *Permian*, the producers' principal witness on the issue of effective competition presented no data on the concentration in ownership of uncommitted gas reserves, although the producers themselves have exclusive possession of these facts." [99] The Examiner inferred such control by a limited number of producers from several facts, including: (1) Eight producers accounted for over 50 percent of the sales and fourteen for over 71 percent. (2) There were 1,198 non-producing gas wells or potential gas wells in southern Louisiana as of June 1962; five producers controlled 52.5 percent, and ten producers controlled 70.4 percent. (3) "[T]hree packages of gas dedicated by Humble and Gulf in South Louisiana in 1963, totalling 12 trillion cubic feet, were larger than the total volume of commitments by *all* producers to *all* interstate pipelines in South Louisiana in any two years combined during the 1951–1961 period." [100] From this influence, plus the producers' failure to rebut the same, the Examiner implied control of uncommitted reserves in the hands of a few large producers.

In addition to finding concentration in control of uncommitted reserves, the Examiner outlined the pattern of producer contracts. In *Permian*, the Commission found that favored-nation and spiral escalation clauses were "calculated to assure that all producers would be treated alike and receive the highest going price both at the time of the contract and in the future." [101] The Examiner made a comparable finding in southern Louisiana.[102] He further found that the terms of the contracts created an artificial demand for gas.

"[T]he 20 year sales contract in this industry has the obvious effect of concentrating the demand for a 20 year supply of gas at the time of purchase. This concentration is compounded when, as was the case in South Louisiana, more one pipeline is seeking supply for major expansions. The result of such concentration of requirements is an abnormal ballooning of demand.[103]"

The Examiner found a lack of competition in southern Louisiana, based upon the pattern of producer contracts and the concentration of reserves. Dr. McKie's statistics were largely discounted. "The presentation by producer witness McKie in the instant case does not meet or answer the practical facts of life with respect to the past history of the production industry during the non-regulatory period." [104] The Commission upheld the Examiner's findings:

"Based upon this analysis we must conclude that there are serious market imperfections which preclude us from relying upon the free operation of the market, as evidenced by arms' length bargaining, to protect the ultimate consumer from unreasonable purchased gas rates.[105]"

The Fifth Circuit supported the Commission's conclusion of an absence of effective competition. However, although concurring in the findings of oligopolistic behavior in the contracting practices of producers and of the relative weak bargaining position of the pipelines, the court still felt the market was at least structurally competitive.[106] However, the court was much more concerned about potential supply problems than about competition among producers. "The most serious problem is that of possible supply deficiencies, together with correlative failure of the Commission to consider supply and demand." [107] Further, Judge Thornberry's opinion was critical of the Commission's reasoning behind "noncost elements" in the rate ceilings. Although deferring to the Commission's expertise in the area, the Fifth Circuit would require the Commission to assess the consequences of its order, particularly how the order might affect industry structure, the availability of capital to the industry, and "most importantly, the industry's probable conduct and performance as a result of the order." [108] The court outlined three steps the Commission should follow in evaluating rates: (1) estimate the demand for gas, (2) fix the level of desired service, and (3) determine how the rate will affect the industry's tendency to meet that level of service.[109] Some twenty-five years ago, the Supreme Court expressed similar ideals for gas rate regulation.

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[98] 40 F.P.C. at 717–18.

[99] *Id.* at 716.

[100] *Id.* at 716–17.

[101] 34 F.P.C. at 184. Indefinite escalation clauses are prohibited. FPC v. Texaco, 377 U.S. 33 (1964).

[102] 40 F.P.C. at 716.

[103] *Id.* at 717.

[104] *Id.* at 718.

[105] 40 F.P.C. at 554.

[106] Southern Louisiana Area Rate Cases v. FPC, 428 F.2d 407, 416 n. 10 (5th Cir. 1970).

[107] *Id.* at 441.

[108] *Id.*

> "Far-sighted gas-rate regulation will concern itself with the present and future, rather than the past as the rate-base formula does. It will take account of conditions and trends at the source of supply being regulated. It will use price as a tool to bring goods to market—to obtain for the public service the needed amount of gas. Once a price is reached that will do that, there is no legal or economic reason to go higher; and any rate above one that will perform this function is unwarranted.[110]"

Such a goal in rate regulation is still adhered to by the Commission. The Fifth Circuit, referring to *Permian*, noted that price should be used to elicit an appropriate level of future exploration and development.[111] However, establishing a price which "brings the gas to market" may not be a sufficient standard in and of itself. The source of supply is controlled by integrated corporations. To the extent there are more attractive investment opportunities, either in other geographic areas or other industries, a management decision would be based upon anticipated financial rewards. Thus, if price is to be a regulatory tool, it must be considered within the context of the regulated supplier's alternative for investment in other industries.

The Commission recently approved a 30 percent rate increase, from 20 cents to 26 cents per Mcf, in order to provide incentive for increasing gas exploration. The FPC staff's econometric model in the *Offshore Louisiana Area Rate Proceeding* [112] concluded that "assuming discoveries equal to 30% of reserve additions a rate increase in the neighborhood of 6¢ Mcf will achieve the target for needed reserve additions calculated by the Commission's Bureau of Natural Gas for 1975." [113] An econometric model was also prepared in *Southern Louisiana*; however, this demand model was rejected by both the Commission [114] and the Fifth Circuit.[115] The model's underlying assumption—the rate of exploratory drilling is more dependent on the rate of production and consumption than on prevailing field prices—was successfully countered by the producers' witness.[116]

The Commission's recent *Southern Louisiana* decision represents a marked departure from prior area rate determinations.[117] Rather than quantifying with precision the several rate components, a zone of reasonableness concept has been adopted.[118] Instead of adhering to a dogmatic cost-of-service principle, the Commission has approved a total rate design package, including rates, incentives, automatic and contingent escalations, and refunds. The Commission has considered a multitude of economic factors in addition to costs, including alternative fuel costs and investment opportunities, the producer's capital requirements, supply and demand, and the intrastate market. Applying economic considerations, in addition to cost factors, represents a novel and, hopefully, successful attempt at producer regulation. In the 1971 *Southern Louisiana* [119] decision, the Commission stated that, as a result of its rate orders, there should be no increase in market concentration in the southern Louisiana area and that new producers should be attracted to the area.[120] However, the Commission was more concerned with remedying a gas shortage, and the prior evidence of noncompetition in southern Louisiana was not discussed.

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[109] *Id.* at 444.

[110] Colorado Interstate Gas Co. v. FPC, 324 U.S. 581, 612 (1945) (Jackson, J., concurring).

[111] 428 F.2d at 419.

[112] Initial Rates for Future Sales of Natural Gas, Doc. No. R–389A, 35 Fed. Reg. 11638 (Oct. 1, 1970).

[113] *Id.*, exhibit 46.

[114] 40 F.P.C. at 625–26.

[115] 428 F. 2d at 436.

[116] 40 F.P.C. at 857.

[117] The same may be said of the decisions in the Texas Gulf Coast Area Rate Proceeding, Op. No. 595 (FPC, May 6, 1971), *appeal docketed sub nom.*, Public Serv. Comm'n v. FPC, No. 1828 (D.C. Cir., Oct. 18, 1971).

[118] Indications of this concept as applied to producer area rates were seen in Commissioner Carver's dissent in Southern Louisiana Area Rate Proceeding, 41 F.P.C. 301, 367 (1969).

[119] Op. No. 598 (FPC, July 16, 1971).

[120] *Id.* at 44–45. It could be argued that two factors, (1) discharge of refunds worth one cent per Mcf and (2) contingent escalations only for pre-October 1, 1968, gas, would discourage new entrants, since only producers presently in the area receive such incentives.

CONCLUSION

"Maintenance of a healthy industry is an important FPC responsibility. . . . [T]he Commission must assess how circumstances other than structure and capital will affect the orderly development of the industry."[121]

Responsibility for regulation of producer wellhead prices was thrust upon the FPC by the Supreme Court in the *Phillips* decision.[122] Many authorities subsequently criticized this decision and many have advocated deregulation of the producers. The area rate method of regulating producer prices has done little to help the producer. Until very recently, the FPC has generally held a lid on prices with the result of affording consumers a bargain fuel but artificially increasing the demand for gas in relation to other fossil fuels.

This author contends that producers of natural gas are properly subject to price regulation.[123] However, a rate-setting procedure other than the area approach is necessary. A procedure that is less time consuming and that considers the realities of the marketplace to a greater extent is certainly preferable. Kitch recently reviewed some alternative theories for setting field prices of natural gas: (1) surrogate market, seeking to balance supply and demand by setting a market price adjusted for market imperfections; (2) price-result, setting a price to elicit the supply of gas needed; (3) traditional cost method; (4) price control, based on historical price data; and, (5) industry protection, setting prices high enough to restrict entry, thereby insuring that the firms in the industry would operate profitably.[124] The traditional cost method is the approach used in setting pipeline rates and is essentially the one utilized in *Permian* in setting producer area rates, with the addition of certain noncost elements. A price control alternative would be comparable to in-line pricing resulting from *Catco*.[125] An industry protection approach would be more feasible in a single product industry; there would be serious drawbacks in attempting to regulate one facet of an international, multiproduct, integrated petroleum corporation. The surrogate market would afford the advantage of realizing a market-oriented pricing system. At the same time, however, this latter method would initiate a great deal of controversy when market imperfections need to be quantified in cents per Mcf. The price-result approach appears to be coming to the forefront with the FPC.

On June 17, 1970, the Commission issued notice of its proposed rulemaking for new gas sales.[126] This notice was subsequently expanded on July 17, 1970.[127] Recognizing the energy crisis and the 1968–69 declines in proved reserves, the FPC sought to issue nationwide rules fixing the terms for permanent certificates for new gas under contracts dated after June 17, 1970. These rates, established under a rulemaking procedure as opposed to an adjudicatory framework,[128] would be firm rates not subject to refund obligation, but could be modified by any subsequent area rate proceeding. The FPC staff and all interested parties were requested to submit (1) estimates of current, nationwide costs of finding and producing nonassociated gas, (2) information relating to rates of return, (3) recommendations concerning the weight to be afforded contract prices in considering producer rates, and (4) analysis of the extent to which the market mechanism will adequately protect consumers. Subsequent to the notice of rulemaking, hearings were held throughout the country. The vast majority of testimony at the New Orleans hearing on August 10, 1970, indicated an immediate interest in raising wellhead prices. For instance, C. C. Aycock, the former lieutenant governor of Louisiana, testified that restrictions on the wellhead price had reduced the potential return on investment,[129] and J. M. Menefee,

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[121] Southern Louisiana Area Rate Cases v. FPC, 428 F.2d 407, 442 (5th Cir. 1970).

[122] 347 U.S. 672 (1954).

[123] Senator Tower introduced a bill to amend the Natural Gas Act, 15 U.S.C. § 717(a) (1964); to exempt producers from "natural gas companies." S. 2442, 92d Cong., 1st Sess. (1971). Another bill, the so-called "sanctity of contract" bill was introduced in 1971. The bill would prohibit the Commission from using its traditional cost-of-service analysis in reviewing the rates in new producer contracts. H.R. 2513 (S. 2505), 92d Cong., 1st Sess. (1971). This bill would require the Commission to consider the supply and demand for gas and the price levels necessary to bring the gas to the interstate market.

[124] Kitch, *supra* note 13, at 191–97.

[125] Atlantic Refining Co. v. Public Serv. Comm'n, 360 U.S. 378 (1959).

[126] Natural Gas in Permian Basin, Doc. No. R–389, 35 Fed. Reg. 10152 (June 20, 1970).

[127] 18 C.F.R. 2.56(a) (1971).

[128] Briefly, the contention is that ratemaking is rulemaking under the Administrative Procedure Act, 5 U.S.C. § 551(4) (Supp. V, 1967). Thus, notice and opportunity for interested parties to submit their views are required, but a full adjudicatory hearing is not. *Id.* § 553(6). *See generally* Hunt Oil Co. v. FPC, 424 F. 2d 982, 985 (5th Cir. 1970); Long Island R.R. v. United States, 318 F. Supp. 490, 498–99 (E.D.N.Y. 1970).

[129] FPC New Orleans Hearing, Doc. No. R–389A, at 17–19 (Aug. 10, 1970); Initial Rates for Future Sales of Natural Gas, Doc. No. R–389A, 35 Fed. Reg. 11638 (1970).

Louisiana Conservation Commissioner, stated that the *Southern Louisiana Rate Cases* had set rates not conducive to the production of natural gas.[130] The Commission has recently taken concrete steps in setting rates through the rule-making process for the Appalachian and Illinois Basin Areas and the Rocky Mountain Area.[131] However, producer price ceilings should continue to reflect costs. To formulate rates based upon national market forces, contract prices, or prices of alternative fuels could conceivably amount to de facto deregulation. On the other hand, price ceilings, once established, could be made more stable over a longer period of time, with allowances for automatic adjustments. The latter would remove some of the uncertainty associated with regulated rates. Finally, since 70 producers account for about 90 percent of the jurisdictional sales,[132] all producers with annual sales of ten million Mcf or less should be exempted from federal rate proceedings.[133] Thus, by concentrating on 70 producers, the Federal Power Commission would in fact regulate 90 percent of the market, and the regulated would represent less of an administrative burden.[134]

There is no reason to expect that perfect competition, absent regulation, would operate in this industry, at least in the southern Louisiana area. Seller concentration, both in terms of interstate sales and control of gas reserves, represents a classic structural oligopoly. Buyer concentration is even greater; however, in light of the current demand for gas, the contracting practices of the producers, and the pipelines' supply requirements, buyers lack the corresponding market power which would normally be associated with tight oligopoly. The producers are in a much stronger bargaining position currently, through alternative investment opportunities and other sources of revenue. Even more importantly, barriers to entry, although still comparatively low, appear to be increasing. A larger company can afford to drill more unsuccessful wells than a smaller firm. The Supreme Court recognized this situation in *Permian:*

> "[A]lthough the resources of the small producers are ordinarily more limited, their activities are characteristically financially more hazardous. It appears that they drill a disproportionately larger number of exploratory wells, and that these are frequently in areas in which little exploration has previously occurred. Their contribution to the search for new gas reserves is therefore significant, but it is made at correspondingly greater financial risks and at higher unit costs."[135]

Moreover, the costs and procedures utilized in bidding for offshore leases is becoming more and more something only the large producer can accommodate. For instance, the federal offshore lease sale of December 15, 1970, resulted in high bids of $850 million for 127 blocks in Offshore Southwest Louisiana. However, the eight largest interstate sellers of gas,[136] either alone or in concert, had high bids of about $225 million on 40 blocks.[137] either alone or in concert, had high entry barriers in the industry, particularly in the offshore areas.[138]

When an industry is noncompetitive because of its market conduct, the offending conduct should be remedied through injunctive action. However, where effective competition is absent because of an industry's market structure, dissolution or divestiture are desirable tools.[139] These policy considerations, although superficially elementary, should underlie the current thrust of antitrust enforcement in the natural gas producing industry. There have been many actions in the petroleum industry to deter inappropriate marketing practices, ranging from reciprocity and price-fixing to false and misleading advertising. However, when the problem arises from market structure, such actions necessarily miss the mark. From the period 1956–68, twenty petroleum companies made 226 acquisitions, 29 horizontal, 169 vertical, and 28 conglomerate.[140] Although many of the firms acquired may have been insubstantial in terms of assets or sales, these acquisitions have largely escaped prosecution by either the Federal Trade Commission or the Justice Department.

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[130] *Id.* at 21–23. *See also id.* at 29 (testimony of Neal Powers, Jr.); *id.* at 36 (testimony of Wilbur R. Lilly).

[131] Initial Rates for Future Sales in the Rocky Mountain Area, Order No. 435 (FPC, July 15, 1971), *appeal docketed sub nom.*, A.P.G.A. v. FPC, Nos. 1812, 1873 (D.C. Cir., Oct. 12, 1971); Area Rates for the Appalachian and Illinois Basin Areas, Order No. 411 (FPC, Oct. 2, 1970).

[132] *See* note 4 *supra*.

[133] The Commission recently announced a policy of blanket certification of small producer sales. Order No. 428B (FPC, July 15, 1971), *appeal docketed sub nom.*, Tennessee Gas Pipeline Co. v. FPC, No. 71–1558 (D.C. Cir., filed July 15, 1971); Order No. 428 (FPC, Mar. 18, 1971).

[134] The Supreme Court has implied that such exemption might be reasonable. Permian Basin Area Rate Cases, 390 U.S. 747, 785–87 (1968); *cf.* Guss v. Utah Labor Relations Bd., 353 U.S. 1, 3–4 (1957).

[135] 390 U.S. at 784–85.

[136] *See* note 55 *supra*.

[137] World Oil, Jan. 1971, at 74–75. There are many indications that the bidding procedures adopted by the Secretary of the Interior are themselves barriers to entry. For instance, by using a cash bonus (determined by bidding) plus a royalty at $16\frac{2}{3}$ percent, the smaller companies can be forced out of the bidding. However, by utilizing a fixed bonus plus a royalty determined by bidding, smaller companies could afford to participate to a greater degree. *See generally* Krueger, *Study of the Outer Continental Shelf Lands of the U.S.*, 1 Pub. Land L. Rev. Comm'n 207–208 (1968).

[138] Hawkins, *supra* note 68. The risk case is still unclear since it may be an inducement to venture capital that would be in the high marginal tax bracket. High risk may not be a deterrent to entry, as witnessed by the number of mutual funds selling pieces of drilling ventures.

[139] Kaysen & Turner, *supra* note 49, ch. III.

Competition is likely to be greatest when there are many sellers, none having any significant market share.[141] Where the number of sellers is limited, competition gives way to parallel policies of mutual advantage.[142] The term "independent producer" is erroneous, since the large, integrated petroleum companies are the producers. Not only do they control the supply and production of oil[143] and gas, they have significant interests in coal and uranium.[144] It is questionable whether the public interest is best served by a few firms controlling the energy supplies of this nation. There has always been an air of cooperativeness in the oil industry, as evidenced by its powerful lobby for tight oil import quotas and its relationships with oil-producing states to eliminate excess output.[145] Uniform pricing is clearly the rule for oil, where nonprice-competitive advertising is so prevalent and concentration is even less significant. Even though the producer is outside the normal public utility rationale for regulation, public policy requires regulation, if not for the noncompetitive structure of the industry, then on the theory of scarce resource allocation or wasting resource preservation. Such regulation must be creative yet cognizant of the structure of the regulated industry, or it must necessarily fail.

THE NATIONAL ENERGY CRISIS—REVISITED

(By John N. Nassikas)

The energy crisis on the horizon three years ago when I last spoke to the National Press Club has now emerged as a dominant issue requiring resolution on a top priority basis. In the near term, our preoccupation is to resolve chronic energy imbalances to avoid disruptions of service to consumers and our economy. Over the long term, our concern must be the assurance of reliable energy supplies to guarantee our survival as the world's greatest Nation. As then predicted, there has been an increased downward trend in our domestic reserves of usable fossil fuels and a corresponding acceleration of demand for these fuel resources. The staff of the Federal Power Commission predicts that gross energy consumption in the United States, which was 69 quadrillion Btu[1] in 1971, will triple by the end of the century. Nonetheless, despite declining reserves of proven and usable reserves of our fossil fuel resources, it is estimated that by the year 2000, we will still be dependent upon petroleum and natural gas to meet more than 50 percent of our energy needs.

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[140] U.S. Oil Week, Mar. 2, 1970, No. 259. *See In re* Kennecott Copper Corp., Doc. No. 8765 (FPC, May 5, 1971) (opinion of FPC invalidating acquisition of Peabody Coal Co. by Kennecott Copper Corp.).

[141] United States v. Philadelphia Nat'l Bank, 374 U.S. 321, 363 (1963).

[142] Brodley, *Oligopoly Power Under the Sherman and Clayton Acts—Economic Theory to Legal Policy*, 19 Stan. L. Rev. 285, 298 (1967).

[143] Twenty-seven petroleum companies produce about 70 percent of the domestic crude and account for about 87 percent of the refinery runs. The Chase Manhattan Bank, Annual Financial Analysis of a Group of Petroleum Companies (1969). At the retail level, four companies control 31 percent of the gasoline sales, whereas in Louisiana (the twentieth largest gasoline consuming state), the top four companies account for 51 percent. Bachman & Wilson, *Major Slices of Gasoline Pie Still Slipping in the United States,* Oil & Gas J., Sept. 13, 1971, at 43–47.

[144] Four oil companies control 20 percent of the coal production. Keystone Coal Industry, U.S. Coal Production by Company (1969). Two oil companies control over one-third of the domestic uranium milling capacity. Arthur D. Little, Inc., Competition in the Nuclear Power Supply Industry: Report to the Atomic Energy Comm'n and the Dep't of Justice (Dec. 1968).

[145] *See generally* La. R.S. (1950). *See* Connally Hot Act. 15 U.S.C. §§ 715–15(k) (1964) (prohibiting the interstate movement of oil produced in excess of state allowables). *See also* Attorney General Report Consenting to the Interstate Compact to Conserve Oil and Gas 69 (Apr. 1969); Attorney General Report Consenting to the Interstate Compact to Conserve Oil and Gas 84 (July 1967).

[1] Energy produced from coal represented about 18 percent of this consumption with natural gas accounting for approximately 33 percent, petroleum and its by-product 44 percent, and the remainder from water power and uranium.

Furthermore, this reliance on fossil fuels will be severely aggravated unless nuclear energy fulfills current projections of supplying about one-third of our energy needs by the end of the century.[2] Because of current regulatory, environmental and technological problems, we cannot predict with confidence that current forecasts of nuclear availability will be met. Presently, there is substantial slippage in the installation of nuclear generating facilities to meet power needs. In February 1973, our Bureau of Power reported that nuclear units, with a total capacity of 27,389 mw, would not be available on schedule this summer to meet power needs.[3]

Currently electric power generation is responsible for about 25 percent of our primary energy consumption. By the year 2000 it is estimated that the electric industry's share of primary energy consumption will be about 50 percent. If nuclear power is not available to provide a substantial part of this primary energy supply to the electric power industry the reference to fossil fuels may not be capable of fulfillment.

Quantitatively, in absolute terms, our domestic energy resource base is adequate to meet energy demands through this century. However, this assumption ignores the fact that there has developed a chronic shortage of deliverable and recoverable resources of the required environmental quality, which are economically accessible. Any number of present constraints continue to preclude timely resource development, including government leasing and tax policies, inadequate capital formation, and investment in exploration and development, prolonged licensing delays, stricter environmental air, water and land use standards, requirements of the National Environmental Policy Act, producer price control under the Natural Gas Act, and the uncertainties arising from current economic conditions. In our restructuring of energy priorities and government controls these constraints will have to be reassessed for their consistency with the overall long-range national interest.

The Federal Power Commission is deeply involved in the effort to resolve our energy dilemma. Our jurisdiction extends to approximately 25 percent of domestic primary energy consumption (natural gas and hydropower) which includes more than two-thirds of the annual production of natural gas, approximately 23 Tcf in 1972. We also regulate LNG imports and exports. Since our ratemaking powers are limited to sales for resale in interstate commerce and do not extend to direct sales, we do not occupy the entire interstate field. Nor do we have authority either to compel producers to explore for or develop gas reserves or dedicate or commit gas to the interstate market.

Our jurisdiction over the production of electric energy is limited to the licensing and regulation of non-federal hydroelectric power projects. Our rate jurisdiction in the electric power area is also considerably more circumscribed than our correspondeing jurisdiction over the rates for the sale and transmission of natural gas in interstate commerce. We regulate about 15 percent of the kilowatt hours sold annually by jurisdictional electric companies (excluding interchanges) which represents less than 7 percent of the annual dollar volume of their sales. We have, however, been charged by the Congress with the responsibility of monitoring national power supplies and "of assuring an abundant supply of electric energy throughout the United States with the greatest possible economy and with regard to the proper utilization and conservation of natural resources * * *"[4]

The most critical issues confronting the Commission in its regulation of the natural gas industry are the formulation of policies to correct our supply deficit, to allocate existing supplies for optimum utilization and to regulate the level and structure of rates to serve the interest of consumers in an adequate and reasonably priced gas supply. Similarly, our chief concerns in regulating the electric power industry are the formulation of policies and voluntary programs that will assure the availability of needed generation on a timely basis—including fuels to drive the turbines of thermal electric generating plants.[5] In addition, we are directly concerned with the encouragement of research and development to provide new and improved power sources, as well as the protection of the public interest in just and reasonable wholesale rate levels and adequate environmental protection on the construction and operation of jurisdictional power facilities.

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[2] In my August 1970 remarks to you, I pointed out: "The program for installations of nuclear power generation has lagged two to three years behind the predicted level of five years ago, when orders for planned systems were largely placed by utilities."

[3] The slippage of 27,389 mw is equivalent to 1.4 trillion cubic feet of gas annually measured in terms of the volume of gas required to generate this power—an amount equal to 35 percent of the 3.98 Tcf of gas used as boiler fuel for electric power generation in 1972.

[4] Federal Power Act, § 202(a), 16 U.S.C. 824a(a).

[5] In my August 1970 remarks to the National Press Club I stated: "I believe that the basic fossil fuel shortage is the most acute phase of our developing energy crisis, dwarfing the formidable problem of installing adequate generation and transmission facilities to meet short-term demand."

These priorities can be expected to persist for the foreseeable future.

ENERGY SUPPLIES—GAS

There is a pervasive and deepening gas supply crisis in the United States. For the last five successive years, we have produced twice as much gas as we have found and our reserves in the lower 48 states have declined by 54.7 Tcf.[6] Over the last decade the domestic gas reserve-to-production ratio for the lower 48 has been cut in half to a current ratio of about 10. Unless we can more than double the ten-year average finding rate of 17 Tcf (sharply reversing the average finding rate for 1968–72 of 10 Tcf) the Commission's Bureau of Natural Gas projects an unsatisfied level of demand for gas of 3.6 trillion cubic feet in 1975, with a widening supply shortfall in the period beyond 1975 and anticipated supply deficiencies of 9.7, 13.7 and 17.1 trillion cubic feet in 1980, 1985, and 1990, respectively, despite the addition of supplemental gas sources to pipeline supply of natural gas in the lower 48 states.[7]

Interstate pipelines have curtailed and are curtailing both firm and interruptible gas service with widespread adverse economic, social and environmental results. Direct industrial sales declined 7.4 percent in 1972. For the April 1972–March 1973 period, fifteen major pipelines have projected deficiencies of almost one trillion cubic feet or about 10 percent of the annual sales of those pipelines representing almost five percent of total annual domestic gas production. This represents a sharp increase from reported deficiencies of 453 billion cubic feet for the April 1971–March 1972 period.

While many of the changes needed to balance the gas supply and demand equation require governmental action, there is one vital activity in which we all can participate—energy conservation. This nation has been profligate in using its energy resources, but the time has come when we must develop and use better methods to produce and transport our energy; to convert and utilize our fossil fuels; and to reduce energy waste to the extent possible. I don't think we will need to forego the leisure and the comforts we get from an abundant energy supply, but we all need to look around and see what we can do to cut down the waste. Consumers can no longer afford to be prodigal in their use of energy. American industry too, with all its efficiencies, has been an energy spendthrift not only because the supply was seemingly inexhaustible but also because it was cheaper to use cheap energy inefficiently than to install more efficient but higher cost equipment. As energy prices rise—and they must—economic trade-offs of energy costs for equipment costs will change and industrial efficiencies will improve. Steam electric power plants for example operate at only about 30 to 35 percent efficiency. Two-thirds of the input energy is wasted, and not only wasted but at the same time creating additional thermal pollution problems. We must put forth the research and development effort needed to examine new conversion techniques. The fuel cell is a good example. This space age technology, brought down to earth and adapted to our commercial needs, offers the potential of significantly increasing the efficiency of converting fossil fuels to electricity, and with a bonus of reduced pollution.

As to gas supply, it is high time that we all face up to the fact that there is a shortage of deliverable natural gas in this nation of formidable proportions and that there is urgent need to support plans for reversing the dismal trends of the past—even though higher costs to the consumer may be the price for a reliable supply. In one of my earliest appearances before a Congressional committee as Chairman, in November 1969, I pointed to the growing gas supply-demand imbalance, and dealing with this problem has been a top priority task at the FPC since I have been there. After over 50 Congressional hearings and participation in seemingly endless interagency conferences, studies and reviews I believe that there is now a consensus that the gas shortage can no longer be either underestimated or tolerated. The consumers' interest in a reliable supply of gas at a reasonable cost and the environmentalists' interest in clean air should coincide in support of attaining national objectives which serve our economy, as well as enabling us to meet our social and international goals.

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[6] As reported by the American Gas Association.

[7] The staff estimate posits net pipeline imports of 1.6 Tcf in 1980 increasing to 1.9 in 1990, LNG imports of 2 Tcf in 1980 doubling to 4 Tcf in 1990, gas from coal at a level of 0.3 Tcf in 1980 increasing to 3.3 Tcf in 1990, and gas from Alaska at .7 Tcf in 1980 and 2.3 Tcf in 1990.

In 1970, we initiated our investigation into the reliability of gas and electric service,[8] an investigation which led to formulation of our curtailment programs to insure that the continuing needs of high priority residential and commercial customers, as well as industrial uses where no satisfactory substitute could be used—could be met with a minimum of economic dislocations. On January 8th of this year we issued a Policy Statement[9] which, along with its subsequent amendments, set forth a list of priorities of service which will best serve the public interest during times when gas service must be curtailed by the pipeline. Briefly, these are the principal groupings of customers: (1) the highest priority classes are reserved for residential and commercial customers, storage gas requirements, and industrial customers needs for plant protection and direct manufacturing process uses; (2) the next lower priority is firm industrial gas requirements for boiler fuel use where alternate fuels could have been used; and (3) the lowest priority is interruptible boiler fuel uses where alternate fuels could have been used. These groups are further subdivided with larger users falling into a lower category since fuel substitution is usually easier in larger installations and the pollution control equipment necessitated by the switch to a less clean fuel is more easily and economically installed.

While our program for dealing with the current problem in an equitable manner is continuing, we must also look to the intermediate term. What will the applicable rules of gas conservation and allocation over the next 5 to 10 year period—a period during which we must live with a chronic shortage of gas? Even if all our technological goals are realized, and we are able to compete for supplies in the worldwide gas market, the tangible results of our efforts are several years away. Early this year the Commission put before the public a proposed policy statement which, if adopted, would provide to all concerned: producer, utility and consumers, the guidelines under which we think the gas industry could operate and maintain its economic viability in this period of shortage. Our stated purpose is to solicit comments which will assist us in arriving at a rational solution to the optimum allocation of limited gas resources in a time of gas shortage. As of the end of last week, we had received a total of 324 comments.

This proposed statement sets forth the priority of service against which we would evaluate any proposals for new or additional service to direct or resale customers, and any other Commission actions which could affect gas deliveries to customers. In addition, we have sought comments on two other gas conservation measures: (1) ways in which we might use our pipeline rate design powers as a means of conserving gas and reducing demand for inefficient uses, and (2) consideration of requiring abandonment of low priority uses. To accomplish this latter goal we have proposed a change of our regulation which would require that all large volume interruptible gas sales, whether for resale to or direct delivery to individual customers, would be made only under contracts which are interruptible at the pipeline's option.

Oil

Our reserve-to-production ratio for crude oil for the lower 48 has been below 10 for the last five years and domestic production has remained relatively stable since 1966. Even considering the 10 billion barrels of crude oil reserves in Alaska, our reserve-to-production ratio would only be about 11. From 1967–1972, there was a 16 percent decline in our domestic daily production capacity of crude oil. To the extent we are compelled to import more crude, as the result of a widening gap between domestic production and demand, rather than discover and find oil within our continental resource base, we aggravate the natural gas shortage, inasmuch as over one-fourth of our natural gas is discovered as an incident to the directional search for oil. Thus, imported oil requirements are further augmented by the limitations on domestic gas supply in part created by expanded oil imports to alleviate a domestic oil shortage.

It has been estimated that by 1980 about 50 percent of our oil consumption will be imported and about two-thirds of these imports will come from the Eastern Hemisphere. There are serious national security considerations involved in such dependence on foreign oil. Equally serious is the fact that not only are higher oil import prices likely but there is no assurance that this country will be able to secure these necessary crude oil imports in the first instance in view of the highly competitive world energy market that is developing.[10]

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[8] Policy Statement Notice of Investigation and Proposed Rulemaking with Respect to Developing Emergency Plans, Docket No. R–405, dated November 4, 1970.

[9] Order No. 467, dated January 8, 1973, Docket No. R–469.

Even if the necessary oil imports are forthcoming, we will have serious balance of payments problems to resolve. Despite profit repatriation from oil companies and shipping companies, the direct effect of projected imports on our account balance could amount to an outflow of $5 billion to $10 billion by 1980.[11]

Oil and gas shortages serve to illustrate the interrelationship and interdependence among primary and secondary energy sources. We must not lose sight of the fact that we have a developing shortage of all usable and deliverable domestic primary energy resources. These shortages have been induced in part by the failure to establish long-range stable policies which can be relied upon to produce the required quantities of energy resources under acceptable environmental standards and at price levels which will attract capital to market the resources. Too often, the natural gas shortage has been used as a convenient crutch for the failure to develop other resources, particularly oil and coal, which are crucial to this Nation's energy balance. Once and for all we should cast aside the myth that a solution to the gas supply problem will solve the energy crisis. Increased domestic gas supply is an energy policy imperative. However, our national energy policy must be so designed as to assure the rational and timely development of all domestic energy resources—coal, oil, uranium, hydro and gas. The energy crisis is a world phenomenon and cuts across the whole spectrum of the diminishing worldwide supply of politically and economically accessible fossil fuels.

DOMESTIC ENERGY RESOURCES

Based upon government resource estimates and conservative projected growth rates of domestic energy demand, we have:

"Potentially recoverable petroleum resources adequate to meet future demand growing at the rate of 3 percent yearly for 44 years;

"Recoverable shale oil reserves at present demand levels to implement oil supplies for about 35 years after depletion of present potentially recoverable oil reserves;

"Potentially recoverable gas resources adequate to meet future demand growing at the rate of 1.4 percent yearly for 65 years;

"Identified coal resources equivalent to 300 years' supply at a growth rate of demand of 2.4 percent yearly;

"Recoverable uranium resources at $30 per pound would be adequate to meet the projected levels of nuclear generation under present technology (without the breeder reactor) growing at the rate of 18 percent yearly for 32 years.[12]"

The economic accessibility of these resources would be importantly influenced by environmenal standards relating to extraction, land use and air and water quality, in addition to the economic and technological factors involved in converting resources to proved reserves.

We cannot expect to produce these resources to fulfill energy demand unless (a) prices are set at levels to attract capital and produce a reurn on investment commensurate with risk and (b) environmental protection standards permit the transitional development of these resources compatibly with energy needs.

It should be noted that prices paid to natural gas producers have generally lagged behind in the consumer price index in this inflationary period, resulting in an erosion of earning capacity and reduced capital formation capabilities of the gas producing industry. The following tabulation shows the prices paid by interstate natural gas pipelines to domesitc producers and the consumer price index:

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[10] As stated by James E. Akins: "But to sustain the view that physical supply and cost are decisive, one must assume that the world's oil is distributed, if not uniformly, at least so that adequate amounts will always be available to all users, in all circumstances and at reasonable prices. This is an assumption that has never been well founded." Akins, James E., "The Oil Crisis: This Time The Wolf Is Here," *Foreign Affairs*, April 1973, p. 465.

[11] See the Annual Report of the Council on International Economic Policy, March 20, 1973.

[12] The above forecasts assume: (1) estimated remaining recoverable resources discovered and undiscovered that could be made available under certain economic and technological conditions, and (2) define proved reserves as those recoverable under existing economic and operating conditions.

	Consumer Price Index[1] (1964=100)		Prices paid to gas producers by interstate pipelines[2]	
	Total	Residential gas	Cents, M ft^3	Index (1964=100)
Year:				
1972	134.9	123.2	20.54	123.9
1971	130.6	119.0	19.23	116.0
1970	125.2	109.3	18.11	109.2
1969	118.3	103.5	17.62	106.3
1968	112.2	101.7	17.32	104.4
1967	107.6	100.7	17.13	103.3
1966	104.6	100.9	16.87	101.8
1965	101.7	100.3	16.70	100.7
1964	100.0	100.0	16.59	100.0

[1] Derived from Department of Labor, Bureau of Labor Statistics Consumer Price Index, wherein 1967 equals 100.
[2] Federal Power Commission form 11.

Insofar as practicable, government policies must be firm, stable, and predictable so as to enable the attraction of capital on a timely basis and in the order of magnitude required for planning, exploration, production, development and marketing of resources and to remove a climate of regulatory uncertainty which deters productive investment. Government should encourage inter-fuel competition in place of artificial government regulatory restraints. With appropriate conservation and environmental standards, workable competition among primary energy industries could be the foundation for a marked improvement in domestic resource development.

Our primary objective should be the maximum efficient development of our domestic resource base, including Alaska and federal onshore and offshore areas. As of October 1973, only about one percent of the Outer Continental Shelf had been leased, despite strong evidence that it contains over half our potential gas and oil resources. These leasing schedules must be expanded and accelerated on a priority basis. Over one-third of the potential gas supply of the lower 48 is located in the South Louisiana and Texas Gulf areas and over half our current domestic gas production comes from these two prolific areas. Along the Atlantic offshore areas, there is a potential of 12 billion barrels of oil and 67 trillion cubic feet of gas, yet not one exploratory well has been drilled from Maine to Florida.[13] Even if prompt leasing is begun, there exists a long lead-time of up to seven years, to locate prospects, acquire leases, drill exploratory wells, install platforms, drill developmental wells, and construct pipelines, before production begins. There are about 327 trillion cubic feet of potential gas reserves and 31 Tcf of proved reserves in Alaska which will be marketable only as the oil reserves are developed and a pipeline certified for oil transport.[14]

Increased imports of liquefied natural gas and accelerated development of synthetic gas from naphtha and gasification of coal are necessary and important adjuncts to our gas supply, even if we succeed in an unprecedented turnaround in the development of our continental natural gas resources.

Based upon a staff analysis of the data on file for supplemental gas projects, the investment costs (dollar per daily cubic feet) approximate $1.62 for LNG imports, $.25–$.40 for SNG, $168 for coal gas, and about $1.05–$1.45 for Alaskan gas. The indicated prices of these supplements (dollars per Mcf) are $.84–$.91 for LNG,[15] $1.10–$1.80 for SNG, $1.00–$1.25 for coal gas, and $.75–$1.25 for Alaskan gas. The approximate prices paid to interstate pipelines by distributors for natural gas from the lower 48 states is about 52 cents in New York, 36 cents in Chicago and 40 cents in Los Angeles. Based upon FPC Form 11 data, the average price paid to producers by interstate pipelines was 20.38 cents per Mcf in 1972.[16]

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[13] The Canadian Petroleum Association estimates potential reserves of 110 trillion cubic feet in offshore eastern Canada and the Gulf of St. Lawrence, with some recent development in the Sable Island area.

[14] The most recent chapter in the TAPS saga is the decision of the U.S. Supreme Court of April 2, 1973, denying certiorari from the decision of the Court of Appeals for the District of Columbia in *Wilderness Society* v. *Morton*, CADC 72–1796, *et al.*, February 9, 1973. In that decision, the Court held that the mineral leasing Act of 1920, 30 U.S.C. 185, prevented approval of the Alaskan pipeline project. The Court deferred resolution of the environmental issues pending determination of the right-of-way dispute. Congressional action on the right-of-way controversy is pending.

[15] Delivered price to liquefaction facilities, East Coast, U.S.

[16] The price to the consumer must include not only producer costs, but also pipeline transportation and distributor costs. Typically, for residential gas heating consumers in the northeastern United States, the price to the consumer may approach $1.82–$1.90. Of this cost, the distributor receives $1.40–$1.45, the pipeline $.22–$.25 and the producer $.20.

While there is considerable debate about the causes of energy shortages and the efficacy of various proposed solutions, there should be no dispute about the cost of halting the decline of energy reserves. The capital demands to meet the required exploratory and development effort will be unprecedented. One recent estimate states that the petroleum industry will require about one trillion dollars to meet the non-Communist world's need for oil products between 1970 and 1985.[17] In this same timeframe, the National Petroleum Council has estimated that the capital requirements of the domestic oil and gas industry will range from $186 billion to $257 billion, or from an annual average of $12.4 billion to $17.1 billion. By comparison, the industry invested at home and abroad an estimated $11.9 billion in 1970. At the high end of the projected range, the additional capital required would represent about a 45 percent increase over the 1970 level. Whether or not such an expansion of financial requirements will strain the industry's ability to attract funds will depend on whether the build-up is gradual or is compressed within a short period of time. The financing, of course, if successful, will be accomplished by way of adequate profits to attract funds in the highly competitive capital market. The allocation between oil and gas will be determined by the prospects for profits in each sector. The allocation between domestic and foreign investment will be similarly determined. To maintain the required profitability, the industry's selling prices must be permitted to adjust to the level of costs that will be experienced as the industry seeks to explore and develop new sources of oil and gas reserves. In addition, the industry will require reasonable assurance of stability in government programs that affect its profitability.

The 1970 National Power Survey projected the capital requirements of the electric power industry (inclusive of distribution investment) between $400 billion and $500 billion for 1970–1990. For the 1971–1985 period, the National Petroleum Council estimated the electric industry capital requirements at $235 billion dollars (1970 dollars), or $15.7 billion per year (exclusive of distribution investment). Investment outlays by the power companies reporting to the Federal Power Commission totaled $14.5 billion in 1970, whereas the National Power Survey forecasts an increase to $20 billion per year by 1980 without any allowance for the effects of inflation.

In view of the investment that will be required and the urgent need for expedited action, federal-industry research and development programs similar to our crash efforts in the area of space technology should be given serious consideration. Such an effort could conceivably be modeled along the lines of COMSAT or some other quasi-public corporation concept. In the event that massive government participation in energy resource development becomes essential, I would prefer joint government-industry efforts along these lines to unilateral, direct involvement in energy research and development by federal entities.

In addition, energy research and development must continue to be increased substantially. Where possible, joint federal-industry efforts such as those underway in the development of coal gasification technology,[18] development of oil shale and tar sands and breeder reactors should be pursued, together with a greatly augmented research and development effort by all energy industries—including fuel cells, fusion, solar energy, geothermal resources and magnetohydrodynamics. In this regard, the electric utility industry is to be commended for the leadership role it has assumed in energy research and development. The formation of the Electric Power Research Institute to undertake a comprehensive R&D effort funded by all sectors of the industry is a model program that other energy industries should emulate.[19] The natural gas industry's efforts in the area of fuel cell development and coal gasification are also highly commendable and should serve as the springboard for launching an unprecedented new R&D commitment by the distribution, transmission and production sectors of that industry.

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[17] The Chase Manhattan Bank, *Capital Investment of the World Petroleum Industry, 1971*.

[18] Undoubtedly, gas from coal will be an important future supplementary source of gas supply. However, the magnitude of coal's contribution to gas supply could be affected by a variety of potential restraints, including financial considerations, strip mining and associated environmental restrictions, availability of sites and the scarcity of water to supply the gasification process. Currently there are pending before the FPC two applications to develop coal gasification facilities and associated coal resources representing almost a $1 billion investment. (El Paso Natural Gas Co., CP73–131, and Transwestern Coal Gasification Co., *et al.*, CP73–212.) The combined annual output of these plants is estimated to be between 170 and 180 billion cubic feet.

[19] To encourage a vastly expanded R&D program, the Federal Power Commission amended the Uniform System of Accounts on August 20, 1970, so that R&D expenditures can be fully recovered through charges to operating expenses on either a current basis or over a period of years and to allow jurisdictional companies to earn a return on unrecovered expenditures. (Order No. 408, 44 FPC 639) At present, as we indicated in Order No. 408, we are proposing to redefine research and development in the Uniform System of Accounts to encourage the kind of innovative research efforts future energy systems will require and to allow recovery of funds advanced through charges to utility operations and also to allow an earned return on unamortized balances in the R&D account. (R–462, Notice of Proposed Rulemaking, December 13, 1972).

Congress must reevaluate the interrelationship between adequate and secure domestic energy supplies and the legitimate and urgent need to protect our environment. As a minimum, there must be a critical reappraisal of the procedural requirements of the National Environmental Policy Act. The detailed and, at times, redundant procedural steps required by that statute have proven to be a windwall for those bent on blocking any and all energy development. Opponents of nuclear power, offshore oil and gas exploration and the development of Alaskan oil and gas resources have succeeded in seriously delaying these vital energy projects by utilizing the procedural roadblocks of NEPA. Often substance yields to form to the prejudice of the public interest. Consistent with full public disclosure and review and the mandate of due process, the procedural nightmares of current legislative requirements should be carefully reexamined and revised to avoid inordinate delays. If procedural methods of carrying out substantive public policies, as well as the finality of the decisional process, are clearly defined by the Congress, the adversary process before regulatory agencies and subsequent appeals to the courts will no longer succeed in delaying crucially needed energy resource development.

ENERGY DEMAND

There are some who advocate zero growth in energy demand as the solution to our domestic energy supply crisis. In my judgment, such an alternative is an unacceptable option that would adversely affect our economic growth requirements and the attainment of our environmental and social objectives.

We must more efficiently utilize our resources by diverting demand from wasteful uses of limited resources and substituting other energy resources so that fuels will be better allocated according to their end use value. As much as is practicable, all costs—from extraction to consumption—should be internalized and the social costs of using energy and reclaiming the earth included in the cost of the final product.

Research and development funding of programs to improve the conversion efficiency of primary energy resources, as well as electricity, will conserve our finite resources without inhibiting essential economic growth.[20] In addition, we must critically evaluate modes of transportation required by a mobile society to conserve resources while protecting our urban environment. The transportation market consumed almost one-fourth of the 1970 energy output, and within this sector, almost three-fourths goes to power automobiles, trucks, and buses. The conversion efficiency of automotive engines, the nation's interstate highway system, air emission standards, mobility of society, and lack of an integrated mass transit system, all impact upon the consumption and demand levels of this sector.

There are also opportunities in the commercial and residential sectors (which collectively consumed about 20 percent of our 1970 energy output) for improved efficiencies in space heating through revisions to municipal building codes, architectural redesign and improved insulation standards.

Furthermore, to attain our national objective of environmental protection, we must remember that more energy will be required to meet our environmental objectives, whether it be for recycling, secondary and tertiary treatment of water wastes, land restoration, or an adjustment within our energy mix towards those sources which degrade the environment the least.[21]

COMMISSION ACTIONS

Since I last addressed this distinguished forum in August 1970, the Commission has taken numerous actions and adopted innovative policies to stimulate domestic gas exploration and development to assure consumers with an adequate gas supply at the lowest reasonable cost. Many of such actions and policies have not had their full impact as of yet because of the uncertainty of court appeals of which we average about 60 litigated cases at any given time. Among our more important actions are:

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[20] While there is about an 80 percent efficiency in recovery of natural gas, coal's recovery efficiency is about 57 percent. Even after secondary and tertiary recovery, the efficiency for petroleum is only 30 percent, and that level is affected by state conservation regulations and the absence of compulsory utilization in many producing areas. There is about a 70 percent loss in energy efficiency through conversion to electricity by fossil-fuel steam-electric plants. There is about 10 percent loss in kilowatt-hours between the generating plant bus bar and the electricity-consuming appliance.

[21] For example, in order to meet the 1975 automobile emission standards it has been estimated that 18 percent more energy is needed with present technology. Also, in order to control thermal pollution and remove particulates and sulphur oxide, it is estimated that power plants will require 7 percent more energy.

Prescribing increased area rates nationwide[22] (except flowing gas in the Rocky Mountain area). We are currently considering proposing by rulemaking the establishment of uniform national wellhead rates;

Substantial price increases in establishing area rates ranging from 30 to 50 percent in the principal producing areas of the United States;[23]

Exempting over 4,000 independent gas producers from price ceilings;[24]

Stimulating pipeline investment through advance payments to producers in return for drilling commitments and gas dedications to the interstate market;[25]

Short-term emergency purchases ranging from 60 days to three years for emergency purchases of natural gas prices above ceiling rates;[26]

Placing pipelines on a parity with producers as to sales by pipeline affiliates;[27]

Optional procedure for certificating producer sales for natural gas at prices in excess of area ceilings by application of economic and market factors in an intercompetitive fuel economy as relevant price determinants;[28]

Rulemaking proceedings to permit higher prices to producers for installation of compression facilities to increase production of gas not otherwise deliverable and to avoid premature abandonment;[29]

Added imports of pipeline gas from Canada;[30] and

Authorization of LNG imports and encouragement of synthetic and gas refinement projects to develop supply increments which the domestic market has been unable to develop.[31] The Columbia LNG project, initiated by filings with the Commission in September 1970, was approved initially on June 28, 1972, and recertified on March 30, 1973. The facilities and ships in that project are estimated to cost $1.7 billion. The Export-Import Bank has agreed to extend $157 million of credit to Algeria for the liquefaction facilities and to guarantee about half of the $400 million to be furnished by private banks for Sonatrach, the Algerian government corporation which will produce the gas.

Following Congressional authorization in December 1970, the Commission instituted a National Gas Survey in January 1971. The Survey will include an independent analysis by the FPC staff, the U.S. Geological Survey and technical experts from the U.S. Navy of the Nation's current proved natural gas reserves. We expect that the Survey will be completed by December 31, 1973, and that the independent reserve study will be issued by May 31, 1973.

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[22] Our authority to prescribe area rates through our rulemaking authority for flowing gas in the Rocky Mountain area was recently affirmed. *Phillips Petroleum Co.* v. *F.P.C.*, No. 71-1659. 10th Cir., February 20, 1973.

[23] Our rate determination for the Hugoton-Anadarko area has been affirmed by the United States Court of Appeals for the Ninth Circuit. *California* v. *F.P.C.*, No. 71–1036, July 31, 1972. Our area rate decisions in the Other Southwest, South Louisiana, and Texas Gulf areas and our initial new gas rates for the Rocky Mountain area are all pending court review at this time.

[24] This Commission action, Order No. 428, was recently set aside by the United States Court of Appeals for the District of Columbia Circuit. *Texaco, Inc.* v. *F.P.C.*, No. 71–1560, December 12, 1972. The Solicitor General has agreed to petition for certiorari from that reversal.

[25] As of August 31, 1972, pipelines had advanced capital of about $1.25 billion as a result of our program to which approximately 9.5 trillion cubic feet of proved reserves may be attributed in the lower 48. See Order No. 465, issued December 29, 1972.

[26] These purchases, made pursuant to Order No. 431, issued April 15, 1971, have resulted in dedications of over one trillion cubic feet of gas to the interstate market. These sales have averaged 5¢ to 10¢ per Mcf above area price ceilings, with the highest single sale of 45¢ per Mcf.

[27] This Commission policy, designed to increase competition in the exploration for, and development of, natural gas, was affirmed in *City of Chicago* v. *F.P.C.*, 458 F. 2d 731 (D.C. Cir. 1971), cert. denied 405 US. 1974 (1972).

[28] This procedure is pending judicial review. *John E. Moss, et al.* v. *F.P.C.*, No. 72–1837, D.C. Cir.

[29] On November 8, 1972. the Commission issued a Notice of Proposed Rulemaking to consider special relief from area ceilings for gas from reservoirs with reduced pressures, or where deeper drilling and reconditioning was required Docket No. R–458. The Commission issued a similar notice on November 9, 1972, concerning special relief from area ceilings for gas being flared or vented. Docket No. R–459.

[30] Pipeline imports from Canada are currently at an annual rate of about 950 billion cubic feet, or about 4 percent of domestic demand.

[31] The Commission authorized the long-term importation of LNG from Algeria in *Distrigas*, Opinion No. 613, about 15.4 million Mcf per year, and in *Columbia LNG*, Opinion No. 622, 390 million Mcf per year. In Opinion No. 637, the Commission authorized Algonquin Gas Transmission Co. to purchase up to 40.2 million Mcf per year of SNG which would ultimately add 30 percent to the volume of gas available in that pipeline's service area.

On June 29, 1972, the Commission instituted a new National Power Survey which will focus on problem areas of crucial importance to the electric utility industry and the Nation's power consumers.

In addition to rulemakings and policy statements on conservation of electric energy, expanded research and development and improved reliability, the Commission is receiving detailed reports on the cost and quality of fossil fuel supplies of electric utilities. These data will facilitate the evaluation of fuel supply developments which may affect the reliability of electric service, emergency preparedness and environmental improvement programs.

ENERGY POLICY

As I indicated to you in August 1970, "There is no single Federal agency with the authority and responsibility to formulate an overall energy policy or to execute a balanced national objective of efficient and productive utilization of our energy resources." As early as January 30, 1970, I had recommended a National Energy Resources Council. Subsequently, I reaffirmed on numerous occasions the need for a Council on Energy Policy. On March 27, 1973, the Senate Commerce Committee favorably reported S. 70, a bill to establish a three-member Council on Energy Policy, to advise the President and the Congress. The President's Department of Natural Resources should be authorized by the Congress to enable effective Executive coordination of energy policies.

I have recommended a Federal Energy Commission to consolidate the existing economic regulatory functions affecting energy. The responsibility for energy import policies, for oil, petroleum products, gas and uranium should be consolidated in either an Executive agency or independent regulatory agency. Such reorganizations of existing responsibilities could provide the institutional framework within which rational energy policies can be developed and executed to serve the national interest.

Congress has not yet adopted "sanctity of contract" legislation to enable the Commission to (1) prescribe producer prices on the basis of economic and market factors, rather than on the basis of cost and (2) provide firm rate levels not subject to later revision. The Commission is limited in its power to establish prices to attract capital investment at levels necessary to expand exploration for and development of incremental gas supplies. We are also restricted in our powers to utilize rate design as a method of more effective resource allocation.

As a result of air quality standards, the demand for gas increases at a time of diminishing supply of other environmentally acceptable fuels. At the same time, the pricing of gas at its economic cost to divert demand to alternate fuels is constrained. Appeals to the courts of any Commission policies designed to serve the consumer interest in a reliable, reasonably priced supply of gas and to allocate our gas resources to higher uses delay the finality of regulatory policies upon which industry can predicate their financial and technical planning. Lead times of five years and more between exploration, development and marketability of gas resources underscore the urgency of adopting governmental gas policies to enable the production of the necessary increments of supply.

Gas producer response to the Commission's policies to revitalize the regulatory climate and increased lease sales by Interior is somewhat encouraging, if belated: In 1972, gas-well development drilling totaled 22.2 million feet—and increase of 28.7 percent over 1971—the highest since 1962; gas-well exploratory drilling totaled 4.6 million feet, the highest since 1960—an increaase of 19 percent over 1971; drilling and production budgets for 1973 are reported to be 7 percent over 1972.

Regraettably, this modest upturn is not enough.

Perhaps in time, particularly with a renewal of oil drilling in the United States, our potential gas resources can be converted to marketable resources with significant increases of the magnitude required to reduce the impact of the gas short-fall. However, we cannot afford the luxury of time. We must accordingly establish a program that will not defer the urgent necessity of a radical upturn in discoveries and dedications of new gas supplies to the interstate market. In the final analysis, regulation of producer prices by the Federal Power Commission requires Congressional action to amend the Natural Gas Act to decontrol the price of new gas supplies which would not otherwise be committed to the interstate market, along the following lines:

"1. FPC price control would be removed for contract commitments to the interstate market of gas from new discoveries, dedications and wells;

"2. The FPC would monitor the effectiveness of decontrol in securing new commitments of interstate gas supplies at a reasonably competitive price with alternative sources of gas and competitive fuels;

"3. The FPC would report annually to the Congress the results of new gas decontrol with recommendations as to continuance or revision;

"4. There would be mandatory Congressional review in 3–5 years to determine whether direct price controls should be reimposed; and

"5. A coordinate leasing program would be instituted for Outer Continental Shelf and other federal domain lands under acceptable environmental standards to insure prospects for investment of venture capital to develop new gas resources for the interstate market consistent with the national interest."

In conclusion, I submit that price decontrol of new gas supplies is not a utopian solution to either the national gas shortage or our overall energy problems. *But, it is worth trying on an empirical basis to see if the economics of the market place will elicit greatly expanded gas development over the course of the next 3–5 years.*

The argument that *workable competition is absent* in the gas producing segment of the industry should not be a deterrent to decontrol legislation for new gas with proper surveillance of market behavior by the Department of Justice and the Federal Trade Commission.

Pending legislation, I will continue to strive for Commission solutions within the ambit of our regulatory powers delegated by the Congress.

AN OUTLINE OF NATIONAL ENERGY POLICY: SOME PERSONAL REFLECTIONS

The energy crisis confronting the United States can be resolved only by a comprehensive national energy policy designed to fulfill energy needs of our society by the efficient utilization of all energy resources.[1] While the FPC is charged with regulatory responsibilities designed to assure the most efficient and productive utilization of our gas and electric energy resources insofar as delegated by the Natural Gas Act and the Federal Power Act, there is no single federal agency to carry out total energy policy to attain a balanced national objective of efficient and productive utilization of our total energy resources—oil, coal, gas, water, nuclear energy. In addition to multiple responsibilities at the federal level, the problem is further compounded by the reality of a state-federal system of economic regulation and resource preservation.[2]

To place the problem in perspective, Table I below outlines the composition of energy production and consumption in the United States for the year 1968 and Table II sets forth the composition of production and consumption of liquid and gaseous hydrocarbons in the United States in 1968.

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[1] I outlined the dimensions of the electric power crisis, systems reliability reserves, fuel shortages, in my testimony on May 7, 1970 before the Subcommittee on Communications and Power, Committee on Interstate and Foreign Commerce, House of Representatives.

[2] Tax policies affect exploration and development for oil and natural gas. Anti-trust and regulatory policies significantly affect inter-fuel competition. The leasing policies of the Department of Interior including the Bureau of Land Management and the Bureau of Indian Affairs in large measure control the minerals extracted from federal and Indian holdings. The U.S. Geological Survey supervises the drilling on all Department of Interior off-shore leases. State pro-rationing agencies affect the amount of oil and gas to be extracted from each lease hold to meet demand. The Federal Power Commission controls the sale of gas in interstate commerce through its certificating powers and control of rates and affects the level of required supply by its regulatory policies relative to producer rates. The Oil Import Administration, the Office of Oil and Gas of the Department of the Interior, the Foreign Trade Zone Boards directly or indirectly affect the amount and price of oil reaching domestic consumers. The Interstate Commerce Commission substantially influences oil markets through its jurisdiction over oil pipeline, road and rail transport, and the Federal Maritime Commission exercises its jurisdiction in the area of water transport on the high seas. Similarly, coal supply is affected by the Federal Coal Mine Health and Safety Act, export policies, transportation policies of the Interstate Commerce Commission and the Federal Maritime Commission, by the polices of the Bureau of Mines or by governmental policies with reference to the development of nuclear power or other energy sources.

TABLE I.—COMPOSITION OF ENERGY PRODUCTION AND CONSUMPTION IN THE UNITED STATES, BY ENERGY SOURCE, 1968[1]

	Percentage of total	
	Production	Consumption[2]
Coal (including lignite)	25.3	21.3
Crude petroleum and products	33.5	39.9
Natural gas, dry	37.0	31.3
Natural gas, liquids		3.6
Electricity, hydro	4.0	3.7
Electricity, nuclear	.2	.2
Total	100.0	100.0

[1] Each energy source is converted to its energy equivalent in terms of Btu's.

[2] Consumption includes net imports of fuel amounting to 7.6 percent of total consumption in 1968.

Source: U.S. Bureau of Mines.

TABLE II.—COMPOSITION OF PRODUCTION AND CONSUMPTION OF LIQUID AND GASEOUS HYDROCARBONS IN THE UNITED STATES 1968

	Percentage of total	
	Production	Consumption
Crude petroleum and products	47.5	53.3
Natural gas, dry	52.5	41.9
Natural gas liquids		4.8
Total	100.0	100.0

Source: Derived from statistics of U.S. Bureau of Mines.

A Commission staff analysis of the anticipated relative use of the various fuels to be converted to energy by the electric utilities during the period 1970–1990 projects the following requirements for fuel expressed in tons of coal having a heating equivalent of 25 million Btu:

TABLE III.—PROJECTED FUEL USE BY ELECTRIC UTILITIES

[Amounts in millions of tons]

	1970		1980		1990	
	Amount	Percent	Amount	Percent	Amount	Percent
Coal	304.6	56.7	472.0	42.5	613.6	38.8
Gas	145.9	27.2	195.9	17.2	245.9	11.6
Oil	59.5	11.1	86.8	7.8	91.8	4.3
Nuclear	27.2	5.0	356.5	32.1	1,176.1	55.3
Total	537.2	100.0	1,111.2	100.0	2,127.4	[1] 100.0

[1] All forecasts of the relative energy mix for power generation are based on the assumption that those fuel resources will be available at the requisite quality level of prescribed environmental standards at an economically feasible price.

To attain the national energy policy objective of the most efficient and productive utilization of our energy resources, I have recommended the establishment of a National Energy Resources Council with the primary purpose of examining the nation's energy resources in relation to long term requirements under a "total-energy" concept recognizing the need to balance economic and environmental concerns.[3] The Council on Energy Resources would be the counterpart to the Council on Environmental Quality to serve the national interest in an assured development of energy resources to meet energy needs in a dynamic economy under a free enterprise system.

The National Environmental Policy Act of 1969 is a comprehensive declaration of national environmental policy with far-reaching effects on the energy industry—gas, electric, coal, oil, hydro. Air, water and land quality standards cannot be developed in an environmental vacuum without consideration of the cost impact on the consumer, the effect of the standards on the availability of the basic resources required to operate our vast technological society, including the generation of electricity,[4] and on the ability of industry to supply needed facilities on a timely basis.

A cardinal tenet of a national energy policy is the formulation of environmental quality standards consistent with the national objective of the most efficient and productive utilization of our energy resources. Fossil fuels are our chief reliance over the next two decades for the generation of electricity which is expected to quadruple by the year 1990. Government policies must be responsibly formulated and executed to improve fossil fuel supply both in the near and long term. A reliably engineered electric system with adequate reserve capacity is a momental exercise in futility if the essential fuels to operate the plant are lacking. I have requested the electric utility industry to seek new methods of insuring the continued reliability of their fuel resources, determine the requisite courses of action for solution of resource supply problems so as to effectively meet demand under practical environmental standards, including the level of funding necessary to develop the required level of all energy resources. To this end I have recommended that an industry task force be convened consisting of representatives of all sectors of the electric utility industry, manufacturers of electrical equipment, the oil, gas, coal and nuclear industries.

I have also recommended—as has the Office of Science and Technology—that the electric utility industry undertake an unprecedented program of research and development to gain the necessary scientific insight into the technology of production, transmission and consumption of electric power with minimum degradation of the environment. This means a higher level of research and development expenditures than has been invested by the electric utility industry in the past to carry out the necessary programs for energy research including the accelerated development of the liquid metal fast breeder reactor; basic fuel research to minimize air pollutant effects; pollution abatement procedures for disposal of waste from fossil fuel and nuclear power plants; high voltage direct current transmission; undergrounding of high-voltage transmission lines; fuel cell research;[5] solar research; magnetohydrodynamics (MHD) or other methods for converting heat energy directly into electrical energy without the need for conventional turbines and generators; basic research and ecology in the life sciences with respect to air and thermal pollution effects; study of long-term effect on human health and other life forms from nuclear and fossil fueled power plant effluents; and development of automatic data processing techniques to predict the environmental impact of planned systems as well as refining regional and national electric load forecasts.

The needs for electric power in the United States are in danger of running a collision course with our demands for clean air. Since natural gas is in tight supply and our nuclear plant construction program has fallen behind schedule, we should recognize that much of the short-term burden of meeting the newly established air quality standards will be concentrated on suppliers of coal and residual fuel oil.[6] The adequacy of our coal supplies cannot be judged by the simple test of heat content. We must also consider the sulfur content of coal and the adequacy and cost of desulfurizing facilities.

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[3] Testimony January 30, 1970 before the Subcommittee on Energy, Natural Resources and the Environment, U.S. Senate, Committee on Commerce.

[4] In my testimony before the Joint Committee on Atomic Energy, on October 28, 1969, I stated the issue confronting the electric utility industry, the regulatory agencies and federal-state governments as follows:

"The establishment of an equitable balance in the public interest between the economic and social concerns of reliability, adequacy of supply and preservation of the environment by an enlightened State-Federal regulatory process in cooperation with a massive industry effort implemented by such State, regional, or Federal legislation as may be necessary to stabilize these objectives is the greatest challenge confronting us today. I have faith that we can meet this challenge, as indeed we must."

[5] The gas industry in association with an aircraft engine manufacturer has made an intensive research effort to develop a commercially feasible fuel cell. The gas industry, however, lags far behind the necessary research and development level required to develop new discovery technology, improved methods of fuel conversion, basic energy and equipment studies. As in the case of the electric utility industry, I urge that all sectors of the natural gas industry—producers, pipeline companies, distributors—invest a substantially higher proportion of their operating revenue in research to accelerate the development of new and more efficient methods of utilization of our energy resources. Large capital commitments to fund advancing technology may require consolidation and pooling of interests.

The small margin that now exists in our coal productive capacity is probably insufficient to accommodate any major new demands for low sulfur coal. The major reserves of low sulfur coal in the United States are in the western states rather than in the traditional supply areas of West Virginia, Kentucky, Pennsylvania, and Illinois. The facilities for delivery of coal—by rail, barge, or truck—also have finite capacity. If the average haul for a load of coal is sharply increased, either because of coal being shipped from more distant mines or because of changes in the geographical pattern of coal consumption by utilities, new transportation bottlenecks could develop.

I understand that we now have the technology for the removal of sulfur oxides from the stack gases of power plants, but that the necessary equipment is not yet available in the required quantity for installation. Yet we may be better off if we defer final action until the equipment can be purchased than if we force companies to switch fuels immediately when they have no guarantee of supply adequacy over the long run. This is a typical planning problem which requires a balancing of short-run against long-run solutions.

Similarly, the supply prospects for residual fuel oil over the next few years are not encouraging. Most of the world supply of residual fuel oil is high in sulfur content. Thus far, the east coast utilities have not experienced serious difficulties, other than higher costs, in switching from coal to low sulfur residual fuel oil to meet air pollution control regulations. Their experience has encouraged some mid-west utilities to apply for permits to import low sulfur oil.

Large additional supplies of low sulfur residual fuel oil would most probably come from North and West Africa. Even if we assume tanker availability, it will still be necessary to establish a new distribution network to bring the supplies to power plants which are not adjacent to deep water ports. Oil companies claim that they can economically transport residual fuel oil by pipeline inland 250–350 miles. Over longer hauls, it probably must be transported inland by barge, rail, or tank truck. This will add substantially to fuel costs.

As with coal, high-sulfur residual fuel oil could be burned without causing air pollution if effective stack cleaning devices could be installed. Apart from this possibility, which could become a reality a few years from now, we can also expect relief from the construction of additional plants to desulfurize the fuel oil. The oil industry in Venezuela has substantial desulfurizing facilities under construction and additional desulfurizing facilities are projected in other parts of the world. The worldwide demand for the low sulfur product is expanding so rapidly, however, that we cannot predict the availability of sufficient new supplies to meet growth.

The hard fact is that we cannot assume that adequate supplies of low sulfur fuels will become available simply because they are needed. Not only does it take time and money to open new coal mines, build new refineries, expand the capacity of our transportation network, and take the many other necessary steps to bring the desired fuels to the ultimate consumers, it also requires coordinated long-range planning by the utilities, the fuel suppliers, and the air pollution control officials, but we have not yet made the institutional arrangements to facilitate this type of planning.

The air pollution control program will experience a major setback if the new regulations lead to power supply crises which compel a suspension of the regulations so that the public can be supplied with electricity. In view of our current tight supply situation for electric power, the risk of that happening is acute.

Costly past experience has taught the power industry that it must give proper consideration to the effects of its actions on the environment. Those responsible for the promulgation of air quality standards carry a parallel responsibility for considering the impact of their decisions on the power industry. Their plans will be counterproductive if they neglect this responsibility.

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[6] We are continuing our surveillance of coal supply, instituted in September 1969, and our review of available residual fuel oil resources to meet projected air pollution standards, and are currently working in conjunction with the Office of Emergency Preparedness to survey electric power problems and adopt policies to improve near term fossil fuel supply, particularly coal. The Committee consists of representatives of: Atomic Energy Commission, Federal Power Commission, Department of Health, Education and Welfare, Department of the Interior, Interstate Commerce Commission, Office of Science and Technology, and Office of Emergency Preparedness.

We can agree, I believe, that the shortest path to solving our air pollution problems in the electric utility industry is through mutual accommodation of air quality goals and power supply requirements.

National energy policy embraces the concept of sound environmental planning which, in turn, encompasses rational evaluation and balancing of all national needs in order to maintain and advance economic progress while preserving the integrity of our land, air and water resources.[7] Unless we are prepared to sacrifice decades of important advances in our standard of living, we cannot condemn out of hand every major industrial and economic decision that results in a change in our land, air and water resources.[8] As a fundamental premise of national energy policy, its primary responsibility for the reliability and adequacy of electric service must be centered in the electric utility industry. The Federal Power Commission has embarked with the electric utility industry on a national program of paramount importance to improve electric power reliability through the Commission's Policy Statement on Reliability and Adequacy of Electric Service, Order No. 383–2, Docket No. R–362, issued on April 10, 1970. System planning and reporting procedures cover ten-year projections of data relating to utility construction and operation. Nine regional electric reliability councils and the National Electric Reliability Councils are working in conjunction with the Federal Power Commission and state regulatory commissions to undertake regional planning, construction and coordination of bulk power supply facilities. The reliability councils will coordinate with 22 formal power pools throughout the United States to attain the declared national objective of Sec. 202(a) of the Federal Power Act of ". . . an abundant supply of energy throughout the United States with the greatest possible economy and with regard to the proper utilization and conservation of natural resources."

With reference to the natural gas industry I conceive as our regulatory objective the utilization of the Commission's regulatory powers in a way which will assure adequate gas service for the consumer at a reasonable price by measures designed to restore the necessary balance between supply and demand and to encourage investment in needed facilities. It is apparent that the most critical issue facing the Federal Power Commission and its jurisdictional sector of the gas industry (pipeline companies and producers) and the state regulatory agencies and their jurisdictional sector of the gas industry (the distribution companies) is the adequacy of gas supply to meet the incremental demands of an expanding national economy. This crisis has developed slowly over the course of the past decade, accelerating in the past five years. Analysis of discernible demand-supply trends impels the conclusion that proved, deliverable reserves to service consumer demand are becoming inadequate.[9]

In the face of ever increasing demands, reserves have been dropping. The American Gas Association, in its recent report on proved reserves, indicated that for the second consecutive year, production exceeded reserves additions. In 1968, when 19.3 trillion cubic feet were produced the findings/production ratio was 0.69. That is, for each Mcf produced only 690 cubic feet of reserves were added. In 1969, the f/p ratio dropped to 0.4 and reserves at the end of 1969 stood at 275 trillion cubic feet.

The Federal Power Commission has attacked the gas supply problem through its regulatory procedures, recommended changes in gas leasing policies of the Department of the Interior, proposed continuance of tax policies designed as an incentive to natural gas exploration, development and production, participation by its Chairman in the Cabinet Task Force study of Oil Import Controls with particular reference to the adverse effects of greater oil imports on gas supply.[10]

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[7] Testimony before the Committee on Interior and Insular Affairs, United States Senate, April 29, 1970.

[8] Testimony before the Joint Committee on Atomic Energy on the Environmental Effects of Producing Electric Power, 91st Cong., 1st Sess., Pt. 1, pp. 32–82 (October 28, 1969).

[9] In my testimony on January 30, 1970 before the Subcommittee on Energy, Natural Resources and the Environment, Committee on Commerce, U.S. Senate, I stated, "Discernible trends of supply and demand indicate a growing national gas shortage in the United States requiring action to arrest undesirable trends." citing a Staff Report on National Gas Supply and Demand, issued by the FPC on September 1, 1969, which asserts (at page 1): "Evidence is mounting that the supply of natural gas is diminishing to critical levels in relation to demand." An FPC Staff Report entitled, "The Gas Supplies of Interstate Natural Gas Pipeline Companies, 1968," issued in January 1970, concludes that, based on gas supply and deliverability information filed by interstate natural gas pipeline companies, by 1974, assuming continued trends of reserve additions and increasing market requirements, there may be a 10 percent deficiency in the ability of the natural gas industry to meet requirements, with the level of deficiency varying from company to company. The FPC Staff Report underscores estimates made in early 1969 by 11 major pipelines that the increased market demand for the 1970–71 heating season indicated a need for new gas in excess of two billion cubic feet daily which at that time had not been contracted.

On August 18, 1969, the Commission urged the Secretary of the Interior to resolve pending regulatory issues "so that systematic leasing and development of new gas reserves may be promptly resumed" in the Outer Continental Shelf. These offshore areas, particularly in offshore Louisiana and Texas, have contributed a rising proportion of the national gas supply and are estimated to be the source of approximately 25 percent of the additional potential reserves of the lower 48 states. The Commission also has pointed out that the leasing policies for federal domain lands may be too restrictive and some consideration might be given to royalty with fixed bonus bids rather than high bonus bids, so as to conserve cash flow and reduce the initial capital commitment of independent producers to stimulate exploration and development of new gas reserves.

The Commission recognizes the importance of tax incentives to encourage domestic natural gas supplies. In a letter to the Vice Chairman of the Joint Economic Committee, dated July 11, 1969, the Commission expressed the view "that reductions in the present tax allowances for natural gas exploration, development, and production . . ., unless offset by raet increases or other relief, would also tend to reduce the level of exploration effort upon which new supplies of natural gas depend, at a time when the adequacy of gas supplies has been called in question." The Commission observed that "there is general agreement that the tax incentives described above have a positive effect in promoting natural gas exploration and production."

Some of the regulatory actions of the Commission relative to gas supply are next summarized.

In Opinion No. 567, October 3, 1969, revision is proposed of the Commission's area rate policy to encourage the search for gas in reservoirs which underlie acreage already committed to the interstate market.

In Opinion No. 568, October 7, 1969, the Commission encouraged intensified natural gas exploration by interstate pipelines by placing pipeline producers on a parity with independent producers allowing area rate pricing of pipeline produced gas.

The Commission has issued a Notice of Proposed Rulemaking to establish ceiling pricing for natural gas produced in the Appalachian and Illinois Basin areas by using the rulemaking approach. We are reviewing the feasibility of expanding this approach to other areas.

We may also cite rulemaking proceedings relating to proposed amendments of the Uniform System of Accounts under the Federal Power Act and the Natural Gas Act to reflect changes in accounting treament of research and development expenditures, to rulemaking proceedings relating to land acquired for future use and to a pending rulemaking proceeding relaing to advance payments which are designed to establish the basis for additional capital commitment and investment return.

One of the most important actions by the Commission relevant to gas industry problems is our order for a complete analysis of area rates in what may be the most prolific gas field in the continental United States—South Louisiana, FPC Docket No. AR69–1.

Since Docket No. AR69–1 is an adjudicatory proceeding, I cannot discuss any evidentiary details at this time. However, our order of December 15, 1969, and the pre-trial conferences in that proceeding, contemplated that the Commission staff would elicit relevant supply data subject to FPC staff audit and cross-examination in order to protect the public interest. In addition, our staff, within limits of its manpower resources is reviewing all available data relating to gas supply generally in an effort to evaluate its reliability.

We have requested funds to conduct a National Gas Survey similar to the National Power Survey. When completed, we should improve our continuing regulatory capability by more reliable factual information relating to reserves, deliverability, and industry's potential as well as realized performance.

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[10] I have discussed gas supply in: Hearings before the Subcommittee on Minerals, Materials and Fuels of the Committee on Interior and Insular Affairs, United States Senate, 91st Congress, 1st Session, November 14, 1969, Committee Print, pages 115–183; Statement of John N. Nassikas, Chairman, Federal Power Commission, Hearing before the Subcommittee on Energy, Natural Resources and the Environment, Committee on Commerce, United States Senate, January 30, 1970, pages 71–95; and Separate Report on the Oil Import Question by the Secretary of the Interior, the Secretary of Commerce, and the Chairman of the Federal Power Commission, released February, 1970, pages 369–393 examines the Impact of the Oil Import Control Program on the Natural Gas and Electric Utility Industries. The use of natural gas in electric power generation is summarized in detail at pages 390–393.

The *South Louisiana Area Rate Cases* (*Austral Oil Co., et al.*, No. 27492, *et al.*, in the United States Court of Appeals for the Fifth Circuit, March 19, 1970) outlines a broad mandate to the Commission for further action in the area of prices and other relevant considerations affecting supply under legal standards defined by the court. The case is now on rehearing. The majority of the Commission has requested a remand of the case to carry out the court's decision. Whatever the ultimate disposition of that case may be, whether by further appeal to the Supreme Court of the United States, remand or affirmance—the Commission will take positive action to secure gas supply through reexamination of area rate pricing policies, nationwide or area by area, or by whatever modifications of regulatory policies as may be necessary to serve the public interest.

We are attempting to give all relevant matters adequate consideration but as an administrative agency, governed by Congressional mandate, we cannot take any action to raise or lower the price of gas—or take any other action relating to regulation—without affording due process to those affected and without satisfying ourselves on an evidentiary record that the public interest, including the consumer interest in an adequate supply of natural gas, is protected.

While national energy policy may, in the near term, be preoccupied with the resolution of shortages, over the long term it must be developed with an eye toward the ultimate goal—that of assuring adequate energy supplies which will allow the nation to grow and prosper. In the near term we must look to conventional gas sources in the lower 48 states and the outer continental shelf, supplemented by Canadian pipeline gas and small quantities of liquefied natural gas from foreign countries. In the second half of the 1970 decade we may acquire substantial additional quantities of pipeline or liquefied natural gas from the Prudhoe Bay Area of Alaska.[11] Our policies with respect to the development of supplementary sources should be such that these sources will be ready when the need arises, but these policies should not permit the development of supplemental sources to interfere with the fullest possible economic utilization of our conventional gas supply or our national security. Three primary supplemental sources: liquefied natural gas, pipeline quality gas from coal, and oil shale, and nuclear stimulation of tight reservoirs appear to offer the greatest potential.

LIQUEFIED NATURAL GAS (LNG)

The importation of LNG via cryogenic tanker ship to provide supplementary supply for the near term future looms ever larger. The eastern seaboard appears particularly of interest, and as you know The Columbia Gas System recently announced the selection of a site for LNG receiving facilities in Maryland.

Previous obstacles to large scale imports of LNG into the United States in the areas of technology, availability of gas, and economics are apparently being overcome. The recent public announcements of plans for two large scale imports of LNG to the United States bear testimony to these advantages. El Paso Natural Gas Company proposes to import one million Mcf per day of LNG from Algeria to the east coast, using approximately ten tankers, with deliveries to commence in 1973. United Fuel Gas Company, a subsidiary of The Columbia Gas System Inc., agreed to purchase from El Paso, LNG equivalent to 300,000 Mcf of dry gas daily for 25 years. Philadelphia Gas Works has indicated that they plan to import 500,000 Mcf per day of LNG from Venezuela to the east coast by 1974. Philadelphia Gas Works feels that this LNG will be competitive with comparable pipeline supplies in the respective service areas. Should these two projects reach fruition on schedule, they would represent less than 2 percent of anticipated annual natural gas requirements in 1975.

At present, the Commission staff is analyzing an application by Distrigas, an LNG marketing firm, to import several shiploads per year to the eastern seaboard. While this service is aimed toward meeting peak shaving gas needs, it nevertheless adds to the nation's gas supply.

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[11] The President of the United States has "directed the Department of State to continue to examine with Canada measures looking toward a freer exchange of petroleum, natural gas and other energy resources between the two countries." The formulation of a common energy policy with Canada offers promising potential for additional natural gas from Canadian gas reserves as well as Alaska gas reserves via pipeline across Canada to the vast mid-continent market. Recent exploratory and drilling activities in eastern Canada and offshore in the area of its maritime provinces offer the hope of developing an additional gas supply near the Northeast market.

Even though these and similar projects may do much to help the nation meet its energy needs, they raise very serious policy questions, questions which must be resolved within any national energy policy. For instance, the policy must consider the extent to which the United States can afford to become dependent on a foreign supply. Decisions to import may also have an impact on the national economy and should be undertaken only after consideration by the appropriate agencies. Imports from abroad could become important elements in our foreign relations and trade policies as well.

COAL AND SHALE GASIFICATION

For the longer term future, a national energy policy must anticipate the development of commercial processes for the conversion of coal and oil shale to pipeline quality gas. We have heard reports today on the technical and economic advances which are being made, and even though there is still a long path ahead, an energy policy must seek to place these developments in their current perspective. It has been estimated that this country's existing coal reserves represent almost 12,000 trillion cubic feet of gas. This is about a 600-year supply at present rates of gas consumption. Obviously, all of these recoverable reserves of coal are not earmarked for the production of gas, nor could they all be mined at present prices. However, this example serves quite well to point up the vastness of U.S. coal reserves and indicates the coal reserves are adequate as a long range supplemental sources of gas. Additionally, no other source of supplemental gas is more reliable from a standpoint of national security.

The technology for the conversion of coal to gas is not new; the difficulty has been to produce a synthetic gas in commercial quantities at prices competitive with natural gas. Much developmental work is currently being directed toward this end by both industry and government and two pilot plants are now under construction and should be completed in the near future—one in Chicago and one near Rapid City, South Dakota. It is hoped that data gathered from the operation of these pilot plants will permit the design and construction of commercial scale plants by the late 1970's. The commercial scale versions of these plants are expected to produce 250–500 million cubic feet of synthetic gas a day. The combined output of two commercial-scale plants, when constructed, would represent less than 2 percent of the estimated U.S. consumption of natural gas in 1980. To make a significant contribution to gas supply in 1980, for example, 10 percent, it would take the combined annual output of about 15–20 such plants and 217 million tons of coal. This is approximately 35 percent of the total 1969 U.S. coal production. We must recognize that enormous investments of money, manpower and other resources will be required to achieve a significant level of gas production by this process.

The timetable for development of this potentially significant adjunct source of gas is already excessively long. The uncertainties of funding the next necessary developmental phase can only extend this timetable, thus further delaying at least partial relief from the gas supply shortage.

OIL SHALE GASIFICATION

The United States possesses the largest single hydrocarbon deposit in the world—the vast oil shale deposits of western Colorado and Utah. While these have been primarily considered as the source of liquid petroleum products, they could also be converted to pipeline quality gas. Limited research work so far has indicated that oil shale can be gasified to produce gas which could be introduced directly into pressure transmission lines at a cost of 50¢ to 70¢ per thousand cubic feet. But exploitation of these reserves must await the implementation of a national energy policy which will foster their development. The policy must consider not only the implications of development of what is a largely federally owned resource but also the legal problems arising from past leasing practices and the impact of such a development on the environment.

NUCLEAR STIMULATION

On the electric power side, the role of nuclear energy in relation to the energy policy matters is well recognized and publicized. Now, as a result of technological development, nuclear energy may play a significant role in gas supply as well.

Nucelar explosive stimulation of tight gas reservoirs offers a potentially effective and economic means of increasing the Nation's natural gas reserves. However, the technology is still in its earliest development stages and it appears that the research and development program will, at best, require several years. Even then, the technique likely will be applied only to those formations which cannot be produced by "conventional" techniques. These conventional techniques themselves are also continually evolving and being improved so that by the time the nuclear well stimulation technology is adequately refined, there may be other, non-nuclear methods for accomplishing the same ends.

However, because of the great potential this method holds, and the relatively small research and development expense involved, continued testing and investigations are merited.

The Bureau of Mines has estimated that 317 trillion cubic feet of natural gas might be made available through successful nuclear fracturing of low permeability formations. However, this estimate should be viewed as a speculative indication of what full utilization of the technique could bring about. Also, the practical and economic removal of radioactive material from the gas has not, as yet, been fully developed.

The possibility of realizing proven gas reserves from this type of projection is not yet fully defined. Though many such experiments are projected, only two are under way. Gasbuggy in the San Juan Basin of northwestern New Mexico and Rulison in the Piceance Basin of west central Colorado.

Gasbuggy with a 26 kiloton device was detonated December 10, 1967, at a depth of 4250 feet in the Pictured Cliffs Formation and has been undergoing production tests. These tests indicate a rather rapid draw-down of both reservoir pressure and production. This behavior is characteristic of low permeability reservoirs and has, in many cases, caused fracture stimulation projects in low permeability reservoirs to have an initial success in increasing production but to become later an economic failure as production rates decline too rapidly to recover costs within a reasonable length of time.

Rulison with a 40 kiloton device was detonated September 10, 1969, at a depth of 8430 feet in the Mesa Verde Formation. Well tests are presently under way but no data have been released other than a recent report indicating that shut-in pressure had reached 2410 psi sometime in November. AEC and Austral Oil Company engineers expect the final formation pressure to be 2500 psi.

Both of these experimental projects have been too expensive to be even considered for commercial applications. However, AEC and Austral engineers predict that should the Rulison project be a success, future Mesa Verde wells in that area can be drilled and fractured with a nuclear device for about $750,000.

A second factor which bears an energy policy concern is the radioactive material formed during the explosion which contaminates the gas in and adjacent to the explosion chamber. To date, no technology exists to remove this radioactive material and make production of clean gas possible. Contamination of the subsurface environment is of equal concern if the contaminants find their way into water supplies.

A third factor is public acceptance. Public acceptance of the use of nuclear devices and of the use of gas that has been produced from a well fractured with nuclear devices may require a long educational process. Complete acceptance of the thought of detonating nuclear devices and the thought of using gas from nuclear stimulation in the home may be slow in coming.

There are many problems to be solved before the Bureau of Mines' estimated 317 trillion cubic feet of natural gas reserves can be put on production and connected to the interstate pipelines systems.

The status of the Canadian and U.S. gas industries can be illustrated by comparing the degree of development of the natural resources bases of the two countries. At the end of 1968, about 90 percent of Canada's estimated gas resource base of 725 trillion cubic feet had not yet been found and only about 1.5 percent of this amount has been produced. This compares with an estimated gas resource base of 1,426 trillion cubic feet for the contiguous United States of which approximately 56 percent has not yet been found and about 24 percent has been produced. The R/P ratio for Canada in 1968 was 34.2 about the U.S. R/P ratio level of 1946. In 1968, Canada produced 1.4 trillion cubic feet of natural gas and exported 43 percent of this amount to the U.S.

In the short term, net imports from Canada have been projected by our staff to meet about 3.5 percent of U.S. consumption. Even for this short term this percentage could be increased if the presently proposed projects to import more gas can be used as an indicator. For the longer term, the Canadian National Energy Board has suggested that, under certain circumstances, Canada could be supplying as much as 15 percent of U.S. gas demands by 1990. While this estimate assumes extensive development of the frontier provinces, the long term outlook for increased imports of Canadian gas is favorable. Since the recent discovery at Prudhoe Bay on Alaska's North Slope, Canadian exploratory efforts have shifted northward from the area where most of Canada's presently proved reserves are located. The oil and gas potential of the Canadian Arctic is expected to be very large because the geologic conditions are similar to those of Alaska's North Slope.

While there are no large supplies of presently proved reserves of natural gas or oil in the Canadian Arctic many experts believe the area has great potential. The Canadian Petroleum Association has estimated that the Arctic Islands Area alone has a natural gas potential of 260.7 billion Mcf. This is approximately 36 percent of the total estimated natural gas potential of Canada and does not include the Mackenzie Delta Area. Recently, plans were announced to conduct a feasibility study with respect to a pipeline extension from the Northwest Territories to the Mackenzie Delta in the Arctic Area of the Northwest Territories. The Mackenzie Delta Area is approximately 400 miles east of the Prudhoe Bay Area and a pipeline into this area could provide another possible outlet for natural gas from Alaska's North Slope. While oil imports from the Arctic (Prudhoe Bay) appear to be nearer at hand, the timing of any substantial imports of natural gas from either the Alaskan North Slope or the Canadian Arctic is very speculative. It is unlikely these resources could become available before the last half of this decade.

It has been suggested that the answer to regulatory problems is to deregulate producer pricing. I do not agree. At a time of a developing national supply crisis deregulation of producer price controls would be contrary to the national interest. There is serious question whether natural gas prices would be *competitively* determined in the absence of producer regulation, or whether interfuel competion can provide a meaningful restraint on the prices that can be charged by producers in all markets. While there may be active interfuel competition in certain industrial and commercial markets, price competition may be seriously impaired in the residential market. Residential consumers may therefore be subjected to unreasonable prices and producers could receive *excessive returns and windfall profits to the detriment of the consuming public.*

Reliance on antitrust enforcement to assure free competition is not an answer to today's natural gas shortage. *The answer is in better regulation—not its avoidance.* I believe at a time of scarce supply that deregulation could result in astronomical price increases from competing pipeline companies attempting to meet demands for gas. If the gas supply crisis which developed over the past five years cannot be resolved in time to meet demands then it may be preferable to establish end-use controls to allocate gas resources by regulation than to abandon regulation and let an unrestrained market operate.

We must reexamine the relationship of prospective price ceilings to market conditions—including the price of LNG, Canadian imports, and increasing quantities of gas sold intrastate—within a regulatory context which recognizes the realities of a reliable supply curve.

Whatever level of rates may be prescribed they must be just and reasonable in the sense that they will produce an adequate level of return to attract the necessary capital for investment in the needed facilities for required service to the consumer.

No examination of national energy policy would be complete without recognition of antitrust considerations. There are substantial economic benefits to be derived from unified planning of generation and transmission, pooling of business and financial risks and the consolidation of managerial talent. Economies of scale have propelled the electric utility industry toward fuller physical interconnection ad more complete management coordination. I can also envision the necessity of consolidating capital and pooling of interests in the gas industry. It is, of course, essential to answer the threshold question as to whether the potential benefits of larger industrial concentrations require more concentrated ownership of gas and electric systems. This issue must be resolved as the cases develop with such participation by the Justice Department as the public interest demands. In any event, it seems to me that substantial argument can be made in support of the proposition that anti-competitive effects of a proposed course of action should be conclusively determined and adjudicated by the Federal Power Commission with reference to its jurisdictional companies rather than continuance of the present regulatory and antitrust dichotomy.

UNITED STATES OF AMERICA FEDERAL POWER COMMISSION

Belco Petroleum Corp., Agent, et al.

Docket Nos. CI73–293, et al.

Opinion No. 639

Appearances

Richard C. Wolfe, *Daniel L. Bell*, and *Tejinder S. Bindra* for Columbia Gas System Service Corporation.

A. D. Gray and *Jack W. Hanks* for Pennzoil Offshore Gas Operators, Inc.

John E. Holzinger, Jr., *Frederick Moring*, and *Richard Morgan* for Associated Gas Distributors.

Hon. George E. Brown, Jr., a Representative in Congress, State of California.

Joseph M. Wells, *Paul E. Goldstein*, and *Ronald Strote* for Peoples Gas Light and Coke Company.

Thomas G. Johnson and *William G. Riddoch* for Shell Oil Company.

J. Evans Attwell, *William P. Pannill*, and *Charles F. Savage* for Belco Petroleum Corporation, Agent.

John E. Watson for Tenneco Oil Company.

Kirk W. Weinert, *John M. Young*, *C. Fielding Early, Jr.*, and *J. Donald Annett* for Texaco Inc.

Harry S. Welch, *J. R. Pankonien*, *L. F. Cadenhead*, *Lilyan C. Sibert*, *Roy C. Alletag*, *Harry S. Littman*, and *Melvin Richter* for Tennessee Gas Pipeline Company, a division of Tenneco Inc.

Robert D. Haworth, *Roscoe Elmore*, *Carroll L. Gilliam*, and *Philip R. Ehrenkranz* for Mobil Oil Corporation.

Peter H. Schiff and *Richard A. Solomon* for the Public Service Commission of the State of New York.

Charles F. Wheatley, Jr., and *William T. Miller* for American Public Gas Association.

Edward W. Stern for Philadelphia Gas Works.

Edward S. Kirby and *James R. Lacey* for Public Service Electric and Gas Company.

Sherman S. Poland for Cabot Corporation.

Peter H. Schuck for Consumers Union of United States, Inc.

Martin N. Erck, *John R. Rebman*, and *John H. Cooper, Jr.*, for Exxon Corporation.

Douglas C. Gray, *George C. Bond*, and *Dee H. Richardson* for Union Oil Company of California.

Michael J. Manning, *Michael J. Hannigan*, *Frank X. Kelly*, and *William J. Ryan* for the Staff of the Federal Power Commission.

Before Commissioners: John N. Nassikas, Chairman; Albert B. Brooke, Jr., and Rush Moody, Jr.

Moody, Commissioner:

OPINION AND ORDER ISSUING CERTIFICATES OF PUBLIC CONVENIENCE AND NECESSITY AND DETERMINING JUST AND REASONABLE RATES

(Issued May 30, 1971)

1. The instant proceedings afford a complete evidentiary hearing presentation of applications for certificates of public convenience and necessity pursuant to Section 2.75 of the Commission's General Policy and Interpretations, the Optional Procedure for Certificating New Producer Sales of Natural Gas as set forth in Order No. 455.[1]

2. On October 24, 1972, Belco Petroleum Corporation, Agent (Belco), in Docket No. CI73–293, filed an application pursuant to Section 2.75 seeking authorization for the sale and delivery of natural gas in interstate commerce to Tennessee Gas Pipeline Company (Tennessee) from the West Delta Block 64 Field, Offshore Louisiana. On November 8, 1972, Texaco Inc. (Texaco) and Tenneco Oil Company

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[1] Statement of Policy Relating to Optional Procedure for Certificating New Producer Sales of Natural Gas, Docket No. R–441 (August 3, 1972), as amended by Order No. 455–A (September 8, 1972).

(Tenneco), in Docket Nos. C173–335 and C173–336, respectively, each filed an application pursuant to Section 2.75 seeking certificates authorizing sales and deliveries of natural gas in interstate commerce to Tennessee from acreage in the East Cameron Block 271 Field, Offshore Louisiana. By Order issued December 26, 1972, the Commission consolidated the above-mentioned applications for hearing and ultimate disposition. Belco, Texaco, Tenneco, and Tennessee are hereinafter referred to as "Applicants".

3. Belco submitted to the Commission a contract dated June 8, 1972, providing for an initial sales price of 45¢ per Mcf with annual rate escalations of 1.5¢/Mcf for the 10-year contract term. Its application requests pregranted abandonment authorization, effective as of the date of expiration of the contract. The Belco contract dedicates approximately 60 Bcf of new gas reserves to Tennessee.

4. The terms and conditions of Texaco's and Tenneco's contracts with Tennessee are identical. The proposed initial price is 45¢/Mcf with annual escalations of 1¢/Mcf over a 20-year contract term. The Texaco and Tenneco contracts dedicate approximately 175 Bcf in new gas reserves to Tennessee.

5. A prehearing conference was held on January 17, 1973; the hearing commenced on February 28, 1973, and concluded on March 27, 1973.

6. During the course of the hearings certain questions arose which resulted in our Order of April 10, 1973, directing the certification of the entire record to us. We have now reviewed the record, and the briefs of the parties, and find that the intermediate decision should be waived and final orders entered herein.

POSITIONS OF THE PARTIES

7. Applicants urge certification of service as provided in their contracts. In this they are supported by Exxon Corporation (Exxon), Union Oil Company of California (Union) and Mobil Oil Corporation (Mobil). The American Public Gas Association (APGA) urges certification at 26¢/Mcf with a 1c escalation in 1974 on the basis that this rate structure prescribed in Opinion 598[2] is still binding on all producers. Congressman George E. Brown and the Public Service Commission of New York (New York) urge denial of certificates, with Congressman Brown arguing that the Applicants have not discharged their burden of proof, and New York arguing that our issuance of a Notice of Rulemaking in Docket No. R–389–B[3] makes use of Section 2.75 undesirable. Commission Trail Staff (Staff) would have us certificate service at an initial rate of 35¢/Mcf with annual escalations of .5¢. Associated Gas Distributors[4] (AGD) supports a forward-looking rate based on cost and non-cost factors, but urges that the Commission formally announce such rate as being of general applicability for a minimum of three years. Philadelphia Gas Works (Philadelphia) not only supports Staff's rate recommendation, but also urges that this rate be declared as a "firm" rate applicable to all Southern Louisiana sales for the next two to three years. Consumers Union of the United States, Inc. (CUUS) opposes certification at 45¢, but supports a rate based on Opinion 598 findings "with only such adjustments as are appropriate to account for changes in area or national costs" since Opinion 598 was decided.

8. The adversary system has produced a record which fully explores the determinative issues. A substantial number of irrelevant issues have also been tried, due in large part to a basic misunderstanding of the nature of this case. To dispel such misconceptions we will comment briefly on the optional certification procedure which Orders No. 455 and 455–A brought into our Regulations as Section 2.75.

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[2] 46 FPC 86 (1971); aff’d *Placid Oil Co.* v. *F.P.C.,* CA5, No. 71–2761, slip opinion dated April 16, 1973.

[3] 38 FR 10014, Notice issued April 11, 1973.

[4] The AGD is composed of the following: Atlanta Gas Light Company; The Berkshire Gas Company, Boston Gas Company, Bristol and Warren Gas Company, Brockton Tannton Gas Company, Cape Cod Gas Company, Commonwealth Gas Company, City of Holyoke, Massachusetts Gas and Electric Department, City of Westfield Gas and Electric Light Department, Concord Natural Gas Corporation, the Connecticut Gas Company, Connecticut Natural Gas Corporation, Fall River Gas Company, Fitchburg Gas and Electric Light Company, Gas Service, Inc., the Greenwich Gas Company, The Hartford Electric Light Company, Haverhill Gas Company, Lawrence Gas Company, Lowell Gas Company, Lynn Gas Company, Manchester Gas Company, Mystic Valley Gas Company, New Bedford Gas and Edison Light Company, The Newport Gas Light Company, Northampton Gas Light Company, North Attleboro Gas Company, Northern Utilities, Inc., North Shore Gas Company, the Pequot Gas Company, Providence Gas Company, South County Gas Company, Southern Connecticut Gas Company, Springfield Gas Light Company, and Tiverton Gas Company (jointly); The Brooklyn Union Gas Company; Central Hudson Gas and Electric Corporation; Consolidated Edison Company of New York, Inc.; Elizabethtown Gas Company; Long Island Lighting Company; New Jersey Natural Gas Company; New York State Electric & Gas Corporation; Philadelphia Electric Company; Philadelphia Gas Works; Piedmont Natural Gas Company, Inc.; Public Service Company of North Carolina; Public Service Electric and Gas Company; Rochester Gas and Electric Corporation; UG. Corporation; and Washington Gas Light Company.

THE OPTIONAL PROCEDURE

9. If we are to avert the economic paralysis which a critical shortage of natural gas threatens, new regulatory procedures are necessary to elicit a supply responsive to increasing demand pressures. Section 2.75 is one of these. Through this procedure we seek sufficient flexibility in rate regulation to permit a matching of pipeline supply needs and an available supply, with due regard to the function of price as tool to bring goods to market, but with adequate consideration also of other factors which bear on protection of the public interest.

10. Our reasons for establishing Section 2.75 optional procedures are set forth in our Notice of Rulemaking,[5] in Order 455,[6] and Order 455–A[7] and need not be restated in full. We incorporate our findings there made into this Opinion and Order.

11. As we proceed under Section 2.75, we intend to examine each application, or set of related applications, as a single gas supply project, in much the same manner as we consider a proposed LNG supply increment as one project to be decided on its own merits,[8] or a proposed SNG purchase as one project to be decided on its own merits.[9] We do not herein set a producer rate of general, industry-wide applicability, any more than we bind ourselves in a particular LNG case to make identical findings in all LNG cases.

12. In considering a supply project, whether it be an LNG or SNG proposal or a Section 2.75 application, we will endeavor to consider all relevant factors—such as cost, return, alternate supplies and energy sources, supply and demand—to insure that gas consumers are receiving the lowest cost available increment of supply. We described this balancing of public interest in Opinion 622–A in these terms: ". . . At any time a . . . supply project comes before us, it must pass the the test of being the cheapest alternative supply of gas currently available to the affected interstate pipeline. If the . . . project does not meet this criterion, we will not approve it for sale in the interstate market." [10]

13. In applying the lowest cost alternative test, we will continue to analyze costs and rate of return, but we will not, and we cannot, be bound to costs as the sole standard of regulation in producer rate matters. [11] This latitude has been granted us by the Courts. [12]

14. In insisting that our decision here is to be read only as a decision on the applications before us, we seek to underscore the essential nature of Section 2.75 cases as proceedings which do not carry industry-wide consequences. Our decision here establishes rates and conditions of service for three individual sales. It does no more. [13] By contrast, an area rate order carries with it straggering implications for national gas supply for years to come.

15. The Commission is not infallible, particularly in that most difficult of regulatory tasks of setting an industry-wide rate which is high enough to elicit the needed supply of gas, but low enough to insure that consumers pay no more than lowest reasonable cost. We created Section 2.75 to permit individualized consideration of pipeline supply acquisitions so that a safety valve would be present outside the industry-wide rate structure. If the continuing impact of an industry-wide rate level is to depress gas exploration and development at a time when it should be increased, Section 2.75 affords a means whereby individual pipeline demands and individual producer supplies can be balanced. So also, if through the weight of the administrative or judical process there is such a delay

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[5] 37 FR 7345, April 6, 1972.

[6] —— FPC ——, August 3, 1972.

[7] —— FPC ——, September 8, 1972.

[8] *Cf.* Opinions 622 and 622–A, *Columbia LNG, et al.,* —— FPC ——, 1972.

[9] *Cf.* Opinions 637 and 637–A, *Algonquin SNG, et al.,* —— FPC ——, 1973.

[10] Opinion 622–A at p. 8.

[11] *F.P.C.* v. *Natural Gas Pipeline Co.,* 315 U.S. 575 (1942); *Forest Oil Corp.* v. *F.P.C.,* 263 F.2d 622 (CA5, 1959).

[12] *Colorado Interstate Gas Co.* v. *F.P.C.,* 324 U.S. 581 (1945); *Permian Basin Area Rate Cases,* 390 U.S. 747 (1968); *Austral Oil* v. *F.P.C.,* 428 F.2d 407 (CA5, 1970), cert. denied 400 U.S. 950; *Hugoton-Anadarko Area Rate Case,* 466 F.2d 974 (CA9, 1972); *Placid Oil* v. *F.P.C.,* No. 71–2761, (CA5, 1973), slip opinion issued April 16, 1973.

[13] The failure to grasp this fundamental point leads APGA to say (Reply Brief, p. 13) that approval of a 45¢ rate here "translates to a 18.8 billion" windfall to the producing industry. APGA so concludes by multiplying 19¢ (the difference between Opinion 598 new gas rates and the 45¢ proposed) by the Potential Gas Committee's estimate of 99 Tcf Southern Louisiana potential reserves. The APGA assertion is wholly false, not only because of its erroneous assumption that any rate over 26¢ is unearned profit, but also because we make no ruling here that would support the premise that all potential reserves in Southern Louisiana will be admitted to the market under Section 2.75 at 45¢/Mcf. It goes without saying that potential reserves do not equate with deliverable reserves available for consumption.

in setting industry-wide rates of general applicability that current costs and current market conditions cannot be attended, Section 2.75 is an avenue for regulatory response to immediate needs.

16. In promulgating Section 2.75 we were convinced that a "supply project" approach should be tried because it promised consumer price and supply protection not possible under an area rate approach. This Commission has experimented with producer regulations since 1960 with full recognition that a Commission-established rate had to fulfill a supply-eliciting function. We now recognize that a Commission error in assessing the supply response to an industry-wide rate level adversely affects every consumer in this country by causing a decline in drilling and developing efforts. Since 1969, every Commission decision in this field has agonized over the supply consequence of the rate orders promulgated, always with a recognition that no device known to man could accurately predict supply elasticity at any given level of prices.

17. Through Section 2.75 we seek to remove the predictive function from ratemaking, at least as to industry-wide consequences. When we approach a Section 2.75 case, we know what gas supply is being brought to the interstate market; and if we do our job properly, we will insure that the increment of supply is added at the lowest reasonable cost. The consumer pays a just and reasonable rate, as determined by this Commission, only for the new gas supply. Necessarily, our actions must insure that each increment of gas added is the lowest cost alternative available to the purchasing pipeline, and that the rate authorized by us, including fixed escalations, for that increment will not change as industry costs move upward, or as additional supply incentives on an industry-wide basis become necessary. This is the certainty of supply, and price, that gas consumers so badly need.

18. The argument for this approach can best be illustrated by comparing the effect on consumers of rising costs when those costs are translated into necessary changes in industry-wide rates. Compare base rates (without regard to state taxes, refund workoffs, or escalations) in Southern Louisiana:

[In cents per thousand cubic feet]

	Southern Louisiana I, opinion 546, Sept. 25, 1968	Southern Louisiana II, opinion 598, July 16, 1971
Flowing gas (prior to Oct. 1, 1968)	18.0	21.375
New gas (after Oct. 1, 1968)	18.5	26.0

We would emphasize that both Commission rate orders were sustained on appellate review, by the same Court of Appeals, so that it is beyond cavil that the 1971 increases were proper to (a) cover increased costs and (b) provide necessary incentives to expand supply. Under the area rate approach, these increases were granted to all gas sales with the expectation, but without any guarantee, that more gas would be obtained. Under a "supply project" approach, we do not grant industry-wide increases, but rather we add known and measurable increments of supply at carefully regulated rates which will not be subject to change through later industry-wide rate orders.

19. In short, we require a flexible, prompt, effective means of securing adequate new supplies of gas for the interstate market at the lowest reasonable cost. That is the purpose of Section 2.75.

20. At the same time we assert the individuality of this decision, we acknowledge that, because this is the first decision under Section 2.75 on a contested record, other applicants and other intervenors will look to it for guidance, as hopefully will also our Staff, as to the type, character, and quantum of proof that we feel necessary to a Section 2.75 decision. What guidance we can give we will give. We state our views fully on the factors we deem significant.

INDUSTRY STRUCTURE AND RATE REGULATION

21. A large portion of the record before us is addressed to an examination of industry structure, and particularly, FPC Economist Dr. John Wilson's testimony. From this testimony, synthesized into Exhibit 33, which purports to show existing business relationships among some producers, it is argued that:

(1) Producer rate regulation must be cost-based, without regard to market conditions; and

(2) Acceptance of the contract prices negotiated by the Applicants here is tantamount to deregulation.

22. The second argument is a *non sequitur*, and may be dealt with summarily. This proceeding is not one to determine if bargained-for rates should be accepted. Thus we find ourselves in complete agreement with Staff in its assertion (Reply Brief, p. 13):

"Entrusting the Commission's designated role as guardian of the public interest to 'negotiations' between producers and pipelines is completely unwarranted and beyond the Commission legal authority."

We are well pleased that Staff grasps so firmly the essence of the Natural Gas Act. But despite its recognition of the obvious fact that we cannot abdicate regulation by unreasoned acceptance of privately bargained-for rates, our Staff undertakes to tell us, at some length, why market prices cannot act as the sole referent in adjudicating Section 2.75 cases.

23. The major premise of this argument, that Section 2.75 was intended by the Commission to function as a regulatory blessing of privately bargained-for rates, is in error. We do not propose to decide this case, nor any Section 2.75 proceeding, on the basis of "what the market will bear." We have always rejected from the inception of Docket R–411, the premise that we are abandoning governmental regulation for market place regulation. In Order 455 we stated:

"Certain comments filed . . . suggest that the Commission is abdicating its ratemaking responsibility by permitting producers and purchasers to set rates by private bargain. Such is not the case. Our actions in individual proceedings arising under these new procedures will answer this objection." [14]

On Order 455–A we stated:

"The second contention . . . that the major premise of the optional procedure is to set natural gas rates solely upon 'market conditions' is similarly without merit. This contention is made without regard or recognition of the evidentiary burden imposed on a seller applicant by Section 2.75(g) and upon the purchaser by Section 2.75(h)." [15]

24. We have not approached these applications on the basis of deferral to private bargain; to the contrary, we have made an appraisal of the applications through consideration of costs, return, supply needs, alternative supply costs, competing fuels costs, and intrastate rate comparisons.

25. The more cogent argument made from the Wilson opinion that the producing industry is not competitively structured is that our rate decision must be based solely on costs. We did not originally believe this to be the litigable issue.[16] but since the issue has been joined on the record, we have undertaken an exhaustive review to determine if there is any substantial doubt as to the reliability or materiality of intrastate gas prices, the costs of alternate fuels, or any other non-cost factor.

26. Comment on the mode of presentation of evidence by Staff as well as the validity of that evidence is called for.

27. First, we observe that the vast bulk of evidence on the market structure of the gas producing industry came into record through cross-examination of Dr. Wilson. This occurred, of course, during hearing and long after Dr. Wilson's direct testimony had been filed, and the Applicant's rebuttal testimony had been filed.

28. For the record let us state that it is not our desire to reintroduce the gamesmanship theory of trying cases, and we expect our Staff to assume a leadership role in this regard. The public interest is not advanced by tactics which result in denial of fair notice of what is to be tried, or denial of a fair opportunity to be heard on those issues.

29. Dr. Wilson's testimony is not, however, of such significance that its inclusion in the record is prejudicial to the Applicants, nor does it require further rebuttal. Staff would have us look to various combinations of producers for specific purposes in specific projects and establish a presumption on anti-competitive behavior. In so arguing, however, Staff recognizes that many combinations are necessary, either because of the need to share risk, because compelled by resource conservation considerations, or because dictated by state law. Staff would also recognize that many combinations result from, and are approved

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[14] Order 455, *supra*, at pp. 15–16.

[15] Order 455–A, *supra*, at p. 4.

[16] See Order of December 26, 1972, in these dockets setting this matter for hearing wherein we stated our intention to consider cost *and non-cost factors*, and directed that questions concerning the purported legality of the Section 2.75 procedures be reserved for resolution in the pending Court of Appeals proceeding directed to this issue. *Moss, et al.* v. *F.P.C.*, Nos. 72–1837, *et al.*, (CADC).

by, actions of the Federal government, particularly with respect to Department of Interior leasing and production policies on Federal lands. We cannot, therefore, conclude that proof of combination is, without more, proof of conduct detrimental to the public interest.

30. We note also Staff's study does not define the relevant product market or geographic market under consideration, nor is it identified as to a time frame, nor does it purport to consider all jurisdictional producers. Staff's study is silent on whether or not producer membership of the groups presented is so static that the combinations have become cohesive entities. Of particular note, we find not one shred of evidence that the end result of such groupings is contrary to the public interest. There is no evidence that unlawful conspiracy exists. There is no evidence of price rigging, either by concerted withholding from the market, or by direct or indirect collusion. There is no evidence of market division. In short, after a full and detailed review of the record, we conclude that:

"1. There is no evidence that these Applicants have engaged in anticompetitive conduct in the marketing of gas.

"2. There is no evidence that intra- or interstate gas contract prices are tainted with anticompetitive conduct by gas producers.

"3. There is no evidence that the prices of alternate fuels are tainted with anticompetitive conduct by oil, coal, or gas producers.

"4. There is no evidence that the prices of supplemental gas sources are tainted with anticompetitive conduct."

31. In 1970, the United States Court of Appeals for the Fifth Circuit said in its *Austral* decision:

" . . . there seems to be general agreement that the market is at least structurally competitive. The Supreme Court in *Permian* described producers as 'intensively competitive.' 390 U.S. at p. 757, 88 S.Ct. at 1354. *See also* P. MacAvoy, *supra* note 9, at 7; E. Neuner, *supra* note 9, at pp. 178–204. 280–381; M. Adelman, The Supply and Price of Natural Gas 39 (1962)." 428 F.2d 407, 416, n. 10.

32. This conclusion regarding competitive structure has been independently drawn by many economic experts. See Martin L. Lindahl, *Federal Regulation of Natural Gas Producers and Gatherers*, Papers and Proceedings of the American Economic Institute, May 1956; Leslie Cookenboo, Jr., *Competition in the Field Market for Natural Gas*, The Rice Institute Pamphlet, Vol. XLIV, No. 4, 1958; Edward J. Neuner, *The Natural Gas Industry, Monopoly and Competition in Field Markets* (University of Oklahoma Press), 1960; Clark A. Hawkins, *Structure of the Natural Gas Producing Industry, Regulation of the Natural Gas Producing Industry* (edited by Keith C. Brown), "Resources for the Future, Inc." (1970).

33. This record does not demonstrate that there has been a factual change in market structure since the *Austral* decision in 1970.

34. Unrealistic "cost based" pricing over the long haul has the same effect as cut throat competition where below real cost prices are used to drive competitors from the market place. We are mindful that in 1960, before the advent of "cost based" area rates, this Commission reported to Congress that there were 18,807 gas producers under its jurisdiction.[17] Our Staff has estimated that, in 1971, domestically produced gas was supplied by less than 4,000 producers.[18] Obviously the producers leaving the field have found more profitable activities elsewhere. Dr. Wilson so recognizes when he states, "There is no reasonable explanation as to why a prudent businessman would decline to take advantage of an opportunity to develop a highly profitable enterprise." (Tr. 352.)

35. While the 26¢ area rate in Southern Louisiana was proper when set, on the record then made, most parties herein (including Staff) agree that circumstances, and costs, have changed to a marked extent. To adhere rigidly to such a rate after it has become less than cost compensatory would certainly tend to drive more producers out of business and tend to create the very anticompetitive structure of which Staff is fearful. The public interest would be doubly disserved by such a course of action, as badly needed exploration and development efforts will be discouraged. Today, we face a situation where additions to proven gas reserves are insufficient to meet existing contract demands (which are substantially below the demand for natural gas), to say nothing of any future growth. At this point in time we need more, not fewer, producers in the natural gas industry.

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[17] U.S. House of Representatives, Special Subcommittee on Legislative Oversight. *Independent Regulatory Commissions*, 86th Congress, 2nd Session (1960) at p. 76.

[18] 1971 *Sales by Producers of Natural Gas to Interstate Pipelines,* FPC Office of Accounting and Finance, at pp. V–VI.

36. Prices commensurate with the risks incident to exploration for and development of natural gas reserves will encourage others to enter (or re-enter) the field, and otherwise stimulate and sustain increased exploration and development. The benefits to a producer, both existing and potential, are well set forth in evidence by Mr. Belfer, president of Belco, including the ability to raise the necessary capital. (Tr. 104–113.) The same considerations which encourage more intensive exploration and development by existing producers naturally encourage and facilitate market entry by others.

37. We are mindful also of what our official records show. Annually since 1961, our Office of Accounting and Finance has summarized data reflected on FPC Form No. 2 and 2–A, and published a study entitled *Sales by Producers of Natural Gas to Interstate Pipeline Companies.* The most recent edition of this study, issued in October, 1972, and covering the calendar year 1971 reflects that interstate pipelines purchased approximately 13 Tcf from domestic producers in 1971.[19] The domestically produced gas was supplied by 101 producers each having annual sales of 10 Bcf or more,[20] 195 producers each having annual sales of more than 2 Bcf but less than 10 Bcf,[21] and an estimated 3,449 producers whose sales were less than 2 Bcf annually.[22]

38. The 296 producers with annual sales of 2 Bcf or more provided 94 percent of the pipeline purchases.[23] The top 22 producers, by volume sold, furnished 71 percent of the gas supplied by all domestic producers in 1971.[24]

39. In 1971, Texaco was the seventh largest seller, with an annual volume of approximately 610 Bcf; Tenneco Oil was the fifteenth largest, with sales of approximately 276 Bcf, and Belco was fifty-seventh, with sales of approximately 28 Bcf.[25]

40. Texaco sold to 27 different jurisdictional pipelines in 1971, Tenneco sold to 21 different pipelines, and Belco sold to 3 interstate pipelines.[26]

41. In such sales, Belco's average unit revenues ranged from 13.73¢/Mcf to 19.32¢/Mcf, while Tenneco sold in the range from 10.64¢/Mcf to 32.04¢/Mcf, and Texaco sold in the range from 10.20¢/Mcf to 36.74¢/Mcf.[27] There is not only substantial variance in the rates charged different pipelines, but also the rates at which each producer sold to the same pipeline in 1971 reflect sharp disparities. For example, Belco sold some Wyoming production to El Paso at 20.10¢/Mcf, and some gas from the same area to the same pipeline at 17.21¢/Mcf.[28] Tenneco sold some Louisiana production to Texas Gas at 17.89¢/Mcf, and other Louisiana production to the same purchaser at 18.69¢/Mcf.[29] Texaco sold some Louisiana production to United Gas at 19.61¢/Mcf, and other Louisiana production to United at 24.50¢/Mcf.[30] In short, actual sales in 1971, as summarized in Table 2 of the 1971 OAF Report, reflect a full exercise of mutual bargaining.

42. We are also aware that in 1971, 60 different producers sold gas in the interstate market from offshore Southern Louisiana.[31] The revenues ranged from 16.42¢/Mcf to 28.66¢/Mcf.[32]

43. In 1971 Tennessee purchased from 78 different large producers,[33] buying from 13 different large producers in offshore Southern Louisiana alone.[34] For offshore gas, Tennessee paid prices ranging from 20.05¢/Mcf to 26.20¢/Mcf.[35] On the average, Tennessee paid Tenneco less per Mcf than Tennessee paid any other Southern Louisiana producer for offshore gas.[36]

44. The foregoing partial summary of 1971 sales reflects no basic change in structural competition on both the buying and selling sides of the natural gas market, which was noted in the *Austral* decision in 1970. Inasmuch as virtually

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[19] Table A, p. VII, 1971 Report.
[20] Preface, p. VI, *id.*
[21] Table 1, pp. 1–6, *id.*
[22] Preface, p. VI, *id.*
[23] *Id.*
[24] *Id.*
[25] Table 1, pp. 1–2, *id.*
[26] Table 2, pp. 34–35; pp. 137–140; pp. 141–147, 1971 Report.
[27] Table 2, pp. 34–35; pp. 137–140; pp. 141–147, *id.*
[28] Table 2, pp. 34–35, *id.*
[29] Table 2, p. 140, *id.*
[30] Table 2, p. 146, *id.*
[31] Table 3, pp. 212–219, *id.* The total of 60 includes only those with sales in excess of 2 Bcf/year.
[32] Table 3, at pp. 212–219, *id.*
[33] Table 5, pp. 493–495, 1971 Report.
[34] Table 3, pp. 212–219, *id.*
[35] Table 3, pp. 212–219, *id.*
[36] Table 3, p. 218, *id.*

all interstate sales reported in 1971 were long-term, there is no basis for assuming any diminution in the ranks of competing buyers or competing sellers. We are convinced, however, that the level of seller competition is increasing in offshore Southern Louisiana, for the results of the most recent Bureau of Land Management Offshore lease sales clearly so indicate.

45. In the September 12, 1972, sale, of the 78 tracts offered, bids were received on 74 tracts and bids were accepted by the Bureau of Land Management on 62 tracts containing 290,321 acres. A total of 324 bids were submitted by all parties participating in the sale. A total of $1,599,155,464 was exposed by all bidders. The total bonus for the accepted bids was $585,827,925.

46. In the December 19, 1972, sale, of the 132 tracts offered, bids were received on 119 tracts and bids were accepted by the Bureau of Land Management on 116 tracts containing 535,874 acres. A total of 690 bids were submitted by all parties participating in the sale. A total of $6.191,018,227 was exposed by all bidders. The total bonus for the accepted bids was $1,665,519,631.

47. At the December sale, 13 pipelines and affiliates exposed $1,324,786,154 for 119 tracts. They expended $332,294,182 for interests in successful bids on 63 tracts.

48. On the basis of the subject two lease sales, it can be concluded there is intense competition for available acreage, and that interstate pipeline companies and their affiliates have increased their participation in the competition for offshore Louisiana acreage. This increase has been in the number of companies involved, the funds exposed and expended and the number of tracts for which they submitted bids. The pipelines and affiliates obtained interests in 53.2 percent of the leases awarded at the September sale and 54.3 percent of the leases awarded at the December sale.

49. We believe that competition for leases presages competition in selling gas. Accordingly, we conclude that an industry that is already structurally competitive will become even more so.

50. Finally, we address the peripheral issues involved in Staff's industry structure arguments.

51. Staff argues that Tennessee is not an independent buyer, as it is in fact buyng gas from itself, and therefore the higher the purchase price, the greater the overall corporate profit. In this regard, Staff is either naively unaware of, or or completely ignores, the fact that Tennessee has neither a purchased gas adjustment clause nor authority to track increased purchased gas costs in its rates. At this time, Tennessee cannot pass through such costs and the allegation that the higher the purchase price, the greater the overall corporate profit is patently false.

52. Furthermore, Tenneco's basic stance in this proceeding is to seek price parity with Belco ad Texaco. Tenneco urges the Commission to set a just and reasonable rate for this gas based on the presentations of the two sellers not associated with the buyer and then allow Tenneco the same price. We conclude that this is the proper approach to this case, and we will follow this reasoning. To treat the Tenneco sale differently because of the affiliation between Tenneco and Tennessee would be directly contrary to our decisions to treat pipline production on a parity with independent production.[37]

53. Staff's view of the broad issue presented—whether natural gas pricing should encompass a review of alternative fuels markets—is tragically shortsighted. This nation is faced with an *energy* shortage of potentially critical proportions. While the nation cries out for a national energy policy, our Staff fiddles with a natural gas pricing issue as though it can be divorced from energy market considerations. Without regard to the fact that natural gas is a wasting asset, irreplaceable in kind and with the most desirable burning qualities of any of the known fossil fuels, Staff urges a pricing system with a demonstrated propensity for both waste and stultification of development, all in the guise of public interest advocacy.

54. Astonishingly, Staff presses, as evidence of noncompetitive industry structure, the argument that the history of the oil and gas industry is replete with numerous complaints of anticompetitive violations. Complaints are no evidence of a fact asserted, but they are indicative of the vigorous surveillance activity on behalf of those affected or charged with the responsibility. We are not persuaded that the activities of the Department of Justice and our legal system—both civil and criminal—are as sterile as Staff necessarily implies.

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[37] Order No. 465, issued December 29, 1972, in Docket No. R–411; Opinion 568, *Pipeline Production Area Rate Proceeding,* 42 FPC 738 (1969).

55. While the foregoing is by no means an exhaustive critique of Staff's anticompetitive presentation, it demonstrates that what we have is the application of a little book learning without appreciation of the factual setting of this case. Staff has ably demonstrated that a text without context is pretext.

DETERMINATIVE ISSUES

56. Basically, we seek determination of but two issues: (1) Should certificates of public convenience and necessity be issued with respect to each proposed producer sale? and (2) what rate level is just and reasonable for these sales?

57. In this opinion we undertake an analysis of the supply project offered by Belco, *et al.*, by considering cost and non-cost market factors. We turn to economic factors other than costs because we believe that rate regulation must conform to economic reality, and that cost calculations can serve only as a point of departure in attempting to determine a proper rate level. In a case such as this, where many assert that we should look to costs alone, it is tempting to do precisely that. As shown at pp. 27–32, *post*, cost analysis yields an estimate of 1971 costs in excess of the 45¢ rate here proposed.

58. We yield not to temptation. The truth is, most simply put, that "costs" reflect judgmental decision, not factual determinations. Accordingly, we utilize costing concepts only as one tool of many, and we turn to other relevant standards for additional guidance in reaching our decision on appropriate rate levels and certificate conditions.

I. COST FACTORS

The Staff's Approach

59. In this record, the Commission Staff undertook the presentation of an updated cost study built along Opinion 598 lines. This was, in Commission parlance, a "new gas" cost study, as opposed to a "flowing gas" cost study,[38] and involves the application of judgmental factors in balancing historic averages with anticipated drilling results.

60. The Applicants sought to counter Staff's presentation through the testimony of Dr. Stephen Sherwin, who recalculated costs by making selective attacks on the Staff study.

61. At the outset of considering the Staff study, and the evidentiary weight to be given it, we must recognize one fundamental problem. A "new gas" cost study is, as used in area rate cases, a predictive rate. An assumption must be made as to the future level of productivity[39] of gas well drilling, and the assumed figure then becomes the keystone of the cost study.[40]

62. We are not here dealing with *anticipated* productivity, for the results of drilling efforts in 1971 (the year in which the Applicants' wells were drilled) are a matter of history, It is most difficult, therefore, to apply cost calculations built on an assumed future level of productivity to test a project which is now ready for commitment to market.

63. In essence, Staff's cost analysis was directed to the determination of that rate which would be proper for future sales, brought about by future drilling. Thus, Staff's study assumed a productivity factor of 600 for its "low" cost estimate, and a productivity of 555 for its "high" cost estimate. The productivity assumptions clearly reflect Staff's judgment of what future productivity of gas-well drilling will be. We recognize that this is appropriate when attempting to set a rate of future applicability, but such an assumption is of limited usefulness here.

64. Because of our reservations concerning the validity of using a predictive rate as a means of testing a present sale, we do not attempt full discussion and resolution of all costing issues raised by Staff's evidence and the Applicants' rebuttal, but rather examine this evidence for what it can impart as to the range of costs which are pertinent to Applicant's proposals.

65. As set forth in the attached Appendix A, the Staff, through Mr. Engle, arrives at a current low cost of 28.27¢/Mcf and a current high cost of 35.58¢/Mcf, before state taxes. Witness Sherwin, for the producer Applicants, arrives at a low estimate of 40.44¢/Mcf and a high estimate of 44.37¢/Mcf as shown in Appendix B.

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[38] See Opinion 468, *Permian I,* at pp. 28–35.

[39] "Productivity" is the term applied to the average nonassociated gas reserves added per foot of successful gas well drilling in a year. Opinion 468, *Permian I,* 34 FPC 159 (1965) at p. 209. Thus, in a year when 17,284 Bcf of reserves are added through the drilling of 20,790,000 ft. of gas well footage (1967), the productivity for that year is 806 Mcf/ft., and in a year when 7,597 Bcf of reserves are added through the drilling of 26,571,000 ft. of gas well footage (1972), the productivity drops precipitously to 286 Mcf/ft.

[40] Opinion 598 at p. 50.

SUCCESSFUL WELL COSTS

66. Engle computed his low estimate of successful well costs as follows:

$$\$27.7/\text{ft.} \div 600\ \text{Mcf/ft.} = 4.62¢\ \text{per Mcf}$$

and his high estimate as follows:

$$\$27.7/\text{ft.} \div 555\ \text{Mcf/ft.} = 4.99¢\ \text{per Mcf}$$

The $27.7 per foot represents a 1971 drilling cost computed by the Joint Association Survey (JAS). The 600 and 555 Mcf per foot figures represent productivity of drilling; 600 reflects the productivity average for 10 to 25 year periods while 555 reflects the average of the 1967–1971 period. It is Engle's view that future productivities will increase above the low figures reported for the last three years.

67. Sherwin, on the other hand, computed his low estimate:

$$\$27.53/\text{ft.} \div 579 \times .95 = 5.02¢\ \text{per Mcf}$$

and his high estimate:

$$\$27.63/\text{ft.} \times 1.04 \div 531 \times .95 = 5.70¢\ \text{per Mcf}$$

His figures differ from those of Engel in part because he excluded data from Alaska (Tr. 2680, 2794). The $27.63 represents the JAS successful gas drilling cost per foot for 1971. In the higher estimate, he introduced the factor of 1.04 to reflect inflation. The productivity figures of 579 and 531 reflect the use of drilling footage published in *World Oil* for the 1957–1971 and 1967–1971 periods. Because he said that since the *World Oil* footage figures have been consistently understated, he reduced the productivity figures by multiplying them by the factor of 0.95, thus arriving at productivity factors of 550 and 504 as the basis for his cost studies.

68. It is clear that both Engel and Sherwin adhered to the predictive function of "new gas" costing by utilizing a productivity figure derived from historic averages. By variance in the data base from which the averages were drawn, they arrive at an estimated level of future productivity ranging from 504 Mcf/ft. (Sherwin) to 600 Mcf/ft. (Engel). We are not persuaded that either judgment should be accorded controlling weight when we consider the following productivity trends:

Year:	*Productivity (Mcf/ft.)*
1967	831
1968	613
1969	285
1970	409
1971	379
1972	284

69. The importance of the productivity factor is highlighted when we bear in mind that Engel's *low* estimate of 28.7¢/Mcf (built on a productivity of 600) becomes an estimate in the range of 48¢/Mcf when the actual 1971 productivity of 379 is used.[41] We conclude, therefore, that successful well costs are substantially understated for 1971 drilling results.

DRY HOLE EXPENSE

70. An assumed productivity factor is again a key component of these calculations. Engel worked from assumptions of 600 and 555, while Sherwin retained his 550 and 504 assumptions. In addition, Sherwin argues that Engel's use of an 8 percent factor as the net adjustment for the greater cost of gas dry holes because of greater depth is taken from the Permian I Opinion in 1965, and that current data demonstrate that that gas well dry hole costs are some 17 percent–24 percent greater than oil well dry hole costs, rather than 12 percent higher as was true at the time of Permian I. Recognizing the need to adjust for the higher success ratio of gas well drilling, Sherwin's testimony indicates that a 12 percent factor overall is now appropriate. We find Engel's dry hole expense to be understated.

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[41] See Appendix C.

RETURN PERIOD

71. Engel applied a 15 percent rate of return over 9 years in his low estimate, and over 10.5 years in his high estimate. This record supports the view that a depletion period of 18 years is reasonable, but acceptance of a 9-year investment return period would then give no effect to the lag time between the investment of lease acquisition funds and the commencement of revenues. Lag time is shown here to be at least 1½ years (Sherwin argues for 1.66 years), and we regard it is imperative that the time value of money invested for exploration and development be recognized. The return period should be not less than 10.5 years.

ROYALTY

72. Engel uses a 15 percent royalty figure in his low estimate and a 16 percent figure in his high estimate. Federal leases in the offshore area carry a royalty of 16⅔ percent, and we believe 16 percent is more nearly representative of current royalty costs.

SUMMARY

73. We cannot accept Staff's assumption of a 600 Mcf/ft. productivity as appropriate in the light of the 1968–1972 productivity trend. Nor can we conscientiously calculate royalty at 15 percent when we know this figure to be inapplicable to offshore Southern Louisiana leases, nor can we adopt a 9-year return period and thereby deny any time value to money invested. These three factors—productivity, royalty and period of return—account for virtually all of the differencess between Staff's "High" cost and "Low" cost estimates. From our rejection of unrealistic productivity, royalty, and return period assumptions, it necessarily follows that Staff's so-called "High" cost figure of 36.58¢/Mcf is in fact the proper starting point for cost consideration.[42]

74. From this starting point of 36.58¢/Mcf, we believe upward adjustments have been shown to be necessary for lease acquisition costs[43] and dry hole costs. Use of the Sherwin adjustments for these cost components would indicate upward revisions in the general range of 1.68¢/Mcf (1.14¢ for increased lease acquisition costs and .54¢ for increased dry hole costs), and accordingly, if we employ a traditional area rate "new gas" costing approach, we would find a minimum cost base of approximately 38.25¢/Mcf as proper.

75. As already noted, this approach to costing involves the use of a predictive judgment. The 38.25¢/Mcf is an estimate of the future cost of new gas, built on the assumption that an average of 555 Mcf of gas reserves will be added for each foot of successful gas well drilling. What, then, is the estimated cost of finding and producing gas which was brounght to market in 1971? No precise answer can be given, but by returning to Permian I,[44] we can add to our analytical base as we search for a range of costs.

B. The "Test Year" Approach

76. The gas which is today offered to the interstate market is the result of 1971 drilling and well completion. Cost considerations can, therefore, be based on a 1971 data base. To analyze costs, still recognizing the lack of mathematical

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[42] We are indeed uncomfortable with a cost study based on a 555 Mcf/ft. productivity figure when this record demonstrates that this level of productivity has not been achieved in any year since 1968. Since we are, however, dealing with costs as only one of several points of reference, and since we are dealing with a range of costs which can only be estimated, we adopt Staff's 36.58¢ cost calculation as a starting point.

[43] Engel based his estimate on a straight cost relationship to successful well costs. For his high estimate of 2.86 cents he multiplied his high estimate for successful well costs of 4.99 cents by a factor of 0.5738, representing lease acquisition costs divided by cost of producing wells (Ex. 11).

Sherwin argues for a factor of .739, which is intended to represent an allocation of leasehold expenditures in proportion to successful drilling costs with an upward adjustment of 18 percent to reflect the current and expected future higher cost of gas than of oil leases. Such an upward adjustment was foreshadowed in Opinion No. 598 (Southern Louisiana): "Assuming *only* the relationship between this item and the item for successful well costs, the calculation of a future gas cost would be marginally higher. However, expected higher costs could well be added. . . ." 46 FPC at p. 132. We agree that such an adjustment is now appropriate, particularly in light of the escalating costs of acquiring leases in the offshore area.

Sherwin's estimate of 4.00 cents for lease acquisition costs also gives effect to the substantial leasehold acquisition expenditures in 1972.

[44] Opinion 468, *supra*.

certainty in any costing methodology,[45] we turn to the basic formula established in Permian I,[46] which was approved by the Supreme Court.[47]

77. In so doing, we agree with, and accept the position of all parties, as expressed on the record, that the concept of average national industry costs, as opposed to individual company costs, should be employed.[48] We will not repeat the error of attempting individual producer cost-of-service regulation.[49]

78. In promulgating Section 2.75 of our Regulations, we clearly stated our intent to rely upon recently completed area rate findings as the cost foundation for consideration of optional procedure applications.[50] We have also clearly stated, prior to the commencement of hearings on the Belco *et al.*, applications, our intent to review Section 2.75 applications in the light of:

> ". . . costs developed in recent area rate decisions (and) increased costs since the close of hearing records, of which this Commission can take official notice . . ." [51]

79. Our cost analysis then, is predicated upon Opinion 468 (Permian I) methodology, and Opinion 598 (Southern Louisiana II) cost findings, modified only to reflect 1971 known results as reflected in various statistical studies [52] upon which the Commission has relied,[53] with judicial approval,[54] in the past.

80. Significant cost changes have occurred since the record in Southern Louisiana II was closed, best illustrated by the following comparison of costs reported by JAS:

	1969	1971
Drilling costs (per foot)	$25	$27.60
Dry hole costs (per foot)	12.80	15.84
Cost of producing wells	1,723	1,508,003
Dry hole cost	888,000	864,000
Lease acquisition cost	1,137,000	642,000
Exploratory overhead	210,000	206,000
Other exploratory costs	782,000	746,000

While drilling costs rose by more than 10 percent and dry hole costs more than 20 percent in this two-year period, other costs which affect FPC costing methodology dropped significantly. We recognize and give effect to both increases and decreases in our analysis.

81. Another major change which has demonstrably occurred since Opinion 598 was issued is found in comparing the results of gas-well drilling in 1971 with the anticipated results used by the Commission in formulating Southern Louisiana area rates. Opinion 598 costing assumed a productivity figure of 600 Mcf; unfortunately, 1971 drilling resulted in a productivity of only 379 Mcf per foot drilled. This change sharply influences at least six cost components.

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[45] *Cf.* Opinion 598, *Southern Louisiana, supra,* at pp. 46–47; Opinion 595, *Texas Gulf Coast,* 45 FPC 674 (1971) at pp. 10–11.

[46] Opinion 468, *supra. Permian I,* of course, utilized cost and productivity averages in order to arrive at a predictive rate. We believe a single year cost analysis is appropriate as one test to be applied in a "supply project" approach to certification of a particular increment of gas supply now ready for commitment to the market. We reserve judgment as to whether a single year cost analysis would be appropriate when we determine a supply-eliciting rate of industry-wide applicability.

[47] 390 U.S. 747 (1968).

[48] In our December 26, 1972, Order setting this case for hearing, we left to the Administrative Law Judge the determination of whether or not special circumstances required the presentation of cost evidence. This question was fully explored on the record, with the result that no party offered evidence on individual company costs.

[49] See *Phillips II,* 24 FPC 537 at 547 (1960), aff'd 373 U.S. 294 (1963).

[50] Order No. 455, *supra,* at p. 21.

[51] Order denying rehearing, *McCulloch Oil Corp.,* Docket No. CI73–133, issued January 18, 1973.

[52] We take notice of 1971 cost components as reported in the most recent edition of the *Joint Association Survey of the United States Oil and Gas Producing Industry* (JAS 1971), the *Statistical Record of the Gas Utility Industry in 1971* (AGA), and American Association of Petroleum Geologists *1971 Report* on Drilling Footage (AAPG). The sources are in the record in connection with Staff's cost evidence.

[53] Reliance by the Commission on statistical sources was expressly noted in Opinion 468 (*Permian I*) 34 FPC 159, issued August 5, 1965, where the Commission described them as "well-recognized and authoritative". 34 FPC at 191. The Commission has utilized these statistical bases in all subsequent area rate decisions.

[54] In reviewing *Permian I,* the Supreme Court approved the use of nationally published statistics (390 U.S. at 801) in producer ratemaking proceedings. More recently, when our use of such data sources was again challenged, the Ninth Circuit affirmed the propriety of Commission use of recognized statistical sources, whether incorporated in the hearing record or not. See *California* v. *F.P.C.,* 466 F. 2d 974 (CA9, 1972) (Hugoton-Anadarko Area Rate Case).

82. For example, the unit cost of gas attributable to successful well costs is, under Permian I:

"... determined ... by dividing the cost per foot of successful wells drilled in 1960 by the average of gas reserves added per foot of drilling in a year."[55]

As further explained in Permian I, "The total reserves added were derived from the AGA proven reserve statistics."[56]

83. Following this formula, Opinion 598, recorded that, on the basis of the record before it, successful well costs, on a unit basis, were in the range of 4.4¢/Mcf.[57]

84. For the year 1971, when drilling costs were $27.64/ft. and the average gas reserves added per foot of drilling was 379 Mcf,[58] successful well costs rose to 7.29¢/Mcf.

85. The final major change necessary to adjust Opinion 598 findings for actual 1971 results lies in the expense component for dry holes drilled. As already noted, dry hole costs rose to $15.83/ft. in 1971 (compared with $12.80 in 1969). Permian I methodology calculated dry hole expense by a formula recognizing dry hole drilling costs, divided between oil and gas well footage averaged over a period of years, and adjusted for the greater depth of gas dry holes.[59] In Opinion 598, dry hole expense was calculated by use of this formula:

Drilling cost/ft × 1.0 × 1.08 ÷ average of reserves added per foot drilled.[60]

86. Utilizing ths formula, Opinion 598 calculated dry hole expense in the range of 2.5¢/Mcf, but when 1971 data is inserted, the result is 4.51¢/Mcf.

87. Making use of 1971 data, and adjusting for cost increases and decreases since 1969, we thus see that 1971 costs compute as follows:

	Cents/Mcf
Successful well costs	7.29
Lease acquisition costs	3.10
Other production facilities	1.65
Subtotal	12.04
Dry hole expense	4.51
Other exploratory expense	3.60
Exploration overhead	1.04
Subtotal	9.15

88. We have no evidence, or statistical basis, for trending Opinion 598 costs in any other respects, and accordingly we continue to rely upon Opinion 598 findings as to:

	Cents/Mcf
Production expense	[1]3.10
Regulatory expense	.20
Net liquid credit	3.89

[1] Opinion 598, at p. 53, *et seq.*

89. So also we retain our Southern Louisiana and all other recent area rate decision findings, that a fair rate of return on investment is in the range of 15 percent.[61]

90. By way of summary, accepting from the Southern Louisiana proceeding those findings which are not shown to have changed, and adjusting for known 1971 results in appropriate instances, we find, through application of traditional FPC costing methodology to 1971 data, that Southern Louisiana gas found as a result of 1971 drilling efforts is produced at an estimated cost of 48¢/Mcf, before state production taxes. This estimate, together with the supporting calculations, are set forth in Appendix C.

CONCLUSIONS CONCERNING COSTS

91. In analyzing costs by traditional Commission standards, and by a "test year" approach, we impart a sense of precision and certainty which can be mis-

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[55] Opinion 468 at p. 50.

[56] Opinion 468, at p. 50.

[57] Opinion 598, at pp. 53–54. A productivity factor of 600 Mcf/ft. formed the base of this calculation.

[58] The AGA estimated nonassociated gas reserves added during 1971 (excluding Alaska) was 8,565 Bcf at 14.73 psia; gas well footage drilled in 1971 was 22,608,000 feet, as reflected in the AAPG 1971 report.

[59] Opinion 468, at pp. 39–42, and Appendix B thereto.

[60] Opinion 598, at pp. 53–54.

[61] *Id.*

leading. We have, from time to time, noted the inherent difficulties of cost allocation, and we would again state:

"The assumptions and selections which are possible, using the same data base, are almost unlimited, and the factors are so interrelated that errors tend to cumulate. . . . The judgmental process is bound to suffer if the goal is to settle upon a mechanical process of pricing gas." [62]

92. We have undertaken a cost review to see where cost considerations lead us in determining a proper rate level. We estimate that the 1971 cost of finding and producing gas is in the range of 38¢–48¢/Mcf, before production taxes.[63] We must move forward, however, to examine these transactions before us by other standards. We use cost as a point of departure [64] and not as a final determinant.

RATE OF RETURN

93. We have heretofore determined that a return in the range of 15 percent is just and reasonable for gas producers.[65] Staff offered testimony here that a 15 percent rate of return is appropriate. No party sought to contradict the propriety of this allowance. In the applications before us, an initial rate of 45¢/Mcf is proposed, and as discussed above, cost fall in the range of 38¢–48¢/Mcf. At the 48¢ cost level, 27.66¢ recovers the cost of service. The return component (16.46¢) produced by a sale at 45¢/Mcf yields a rate of return of 12.4 percent.[66] At the 38¢ cost level, 23.46¢ recovers the cost of service. The return component (20.43¢) produced by a sale at 45¢ yields a rate of return of 17.8 percent.[67]

94. Calculation of yielded return can be no more precise than the cost of service figures involved in the calculation; accordingly, we can only estimate that the Applicants will earn between 12 and 18 percent if sales commence at 45¢/Mcf. We have already noted our skepticism of the 38¢/Mcf cost calculation, because of its reliance on a productivity factor of only 555, and our belief that costs are closer to the 48¢ estimate because of declining productivity. Accordingly, we estimate that the return allowed here, at a rate of 45¢/Mcf, is within a zone of reasonableness centered around 15 percent.

II. NON-COST FACTORS

95. We turn now to other relevant considerations affecting a determination of rate and certificate issues.

A. *Supply Considerations*

96. The proposed sales will add approximately 235 Bcf of natural gas reserves to the Tennessee system, with estimated first year deliveries of approximately 36 Bcf. In 1971, Tennessee was able to contract for only 450 Bcf of new gas reserves, and for only 820 Bcf of new gas reserves in 1972. In each year, the new gas contracted for was less than Tennessee's system requirements.[68] The last time Tennessee was able to purchase enough new gas to equal the amount it sold was 1965; the last time Tennessee was able to make a net addition to its gas supply position was in 1960, when it was able to purchase more than it sold.[69] Clearly, it is not in the public interest for Tennessee to continue depletion of its reserves. This trend must be reversed if the consumers dependent on Tennessee are to continue to have a reliable and adequate supply of gas.

97. This record establishes Tennessee's inability to contract for a gas supply equivalent to the proposed Belco, *et al.*, sales at a lower price than 45¢/Mcf.[70]

98. As noted in our Order setting these dockets for hearing, no party by its pleadings raised an issue concerning Tennessee's need for the supplies here offered, and no evidence was offered during the hearing that qustions the urgency of Tennessee's supply procurement efforts.

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[62] Opinion 598 at pp. 48–49.

[63] In Opinion 598 we concluded that there was a cost range of 4¢–6¢/Mcf which could not be narrowed further with any degree of accuracy. We now estimate the range to be 10¢/Mcf. While we might wish for greater precision, it is not possible and we prefer not to delude ourselves, or a reviewing court by pretense to greater certainty than exists.

[64] *Cf. City of Detroit* v. *F.P.C.*, 230 F. 2d 810 (CADC, 1955, and *Hugoton-Anadarko Area Rate Cases, supra*, at p. 22.

[65] Opinion 598, *supra*, at p. 52: see also *Hugoton-Anadarko Area Rate Case, supra*, at fn. 12.

[66] See Appendix D for return calculations.

[67] See Appendix E for return calculations.

[68] Tr. 82 : 653–659.

[69] Tr. 656–660.

[70] Tr. 79–83 ; 811–813.

99. The public convenience and necessity clearly require certification of the proposed sales at the rate we herein determine to be just and reasonable, for without additional long-term supplies Tennessee cannot continue to meet the needs of those who rely upon it for gas service.

B. Comparison with Other Contracts

100. The initial proposed rate of 45¢/Mcf should be tested against the current market for natural gas in Southern Louisiana as demonstrated by other contracts. This record reflects the following with respect to recently negotiated contracts:

Price range

Short-term interstate sales, 35 cents to 50 cents.
Long-term intrastate sales, 38 cents to 52 cents.

101. We cannot safely ignore this data. Short-term interstate purchases are being made under our Order 431[71] and pursuant to our approval by pipelines facing emergency conditions. This form of gas procurement is not available to Tennessee.[72] Nonetheless, Tennessee must compete for new gas supplies or it, too, will face an emergency. Accordingly, the price paid by others, with our approval, is material to consideration of the supply project under consideration. As to intrastate sales, even though intrastate prices cannot reach gas produced from the federal domain, we must face economic reality. If interstate prices lag far behind intrastate prices, we can only expect a concentration of drilling activity to occur in those areas where the intrastate market is in a buying position, with a consequent diminution of activity in the federal offshore area. This result would harm interstate gas consumers by causing a lessened effort at timely development of a supply area fully committed to the interstate market.[73] Accordingly, while we do not give controlling weight to current market trends as reflected in current contract prices, we consider these facts together with all others in arriving at our determinations herein.

C. Comparison with Other Sources of Supply

102. In testing the proposals before us, bearing in mind that our primary purpose is the identification and protection of the public interest, we weigh the effect on the consumer of adding this increment of gas at 45¢/Mcf, as compared with the consumer effect of adding supplemental supplies from nonconventional sources. All parties to this case agree, and most certainly we find, that Tennessee has an immediate need to contract for additional base load volumes to meet existing customer needs. If Tennessee purchases from non-historic sources, this record reveals the estimated cost to be:

Source and estimated cost

Canadian gas—112 cents to 132 cents per Mcf.
Coal gas—120 cents per Mcf.
Reformed gas (petroleum feedstock)—105 cents to 143 cents per Mcf.
LNG—91 cents to 100 cents per Mcf[74].

These prices are estimated on the basis of city gate deliveries in New York. The approximate pipeline cost of moving gas from Southern Louisiana to New York is 30¢/Mcf[75], so that the proposed sale at 45¢ at the wellhead represents a substantial saving to customers served by Tennessee.

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[71] Issued April 15, 1971, in Docket No. R–418. We have approved 225 short-term sales at rates ranging from 26¢/Mcf to 45¢/Mcf. No appeal of any certificate issued, even at 45¢/Mcf, has been taken.

[72] Our order of July 30, 1971, in Docket Nos. CP–71–275 and CP–71–302 denied Tennessee the use of Order No. 431 procedures because Tennessee was not in "an emergency".

[73] We categorically reject the concept advanced by some that the price of gas sold from the federal domain should be held down because the producer there cannot sell his product without our approval. Federal domain rates shall be determined fairly, and consistently with all other rates. Any other approach would be antithetical to our basic decision in Opinion 598 granted, in effect, a 2.3¢/Mcf rate incentive to federal domain production this area holds the greatest immediate promise for alleviation of the supply shortage. In Opinion 598 were granted, in effect, a 2.3¢/Mcf rate incentive to federal domain production by allowing offshore gas to be sold at the same rate as onshore gas subject to state production taxes. This approach has been expressly sanctioned. See *Placid Oil Co.* v. *F.P.C., supra,* at pp. 40–41.

[74] Exhibit 7; Tr. 175, *et seq.*

[75] Tr. 281.

D. Commodity value of Natural Gas

103. The Commission has not, historically, undertaken to test a producer rate proposal in terms of the value of natural gas to the consumer. Although it is without question that price relationships between substitutable fuels in the energy market affect the supply of and demand for each fuel component, the Commission has not turned its attention to fuel price relationships. Today, with a gas shortage of critical proportions causing reverberations throughout the economy, we undertake consideration of this question because of our recognition that effective, efficient resource allocation cannot take place without full consideration of the totality of the energy market. If natural gas sells at too low a price in relation to other fuels, the demand for gas will continue to mount astronomically through an artificial stimulus. Irreplaceable volumes of this valuable finite resource will be consumed, not because gas is the best fuel for the particular need, but because it is the cheapest fuel. Nationally, we cannot afford the luxury of such waste.

104. This record reflects a detailed study, on a comparative basis, of the cost of substitutable forms of energy in sixteen areas served by Tennessee and its resale customers.[76] While, as New York points out,[77] this study is predicated on an averaging of fuel costs for different types of service, we find it useful in our determination of this case. This generalized study, purporting to arrive at a "commodity value" on the basis of averages and assumptions, lends the appearance of precision and certainty. We have no blind faith that such an appearance is warranted, and accordingly, we do not embrace this study as determinative of our decision. We accept it as a useful tool in measuring the proper level of rates to apply in this case.

105. The comparative fuels cost analysis sponsored by Texaco shows that the present retail price of gas sold by Tennessee is 48¢/MMBTU below the cost of substitutable energy sources. When consideration is given to protection of residential and small commercial uses during times of curtailment,[78] and the consequent possibility of lessened industrial service, the study reflects that gas sold by Tennessee is 26¢/MMBTU below the price of substitutable energy sources.

106. The commodity value differential is relatable to the price paid by Tennessee for gas purchases in the field by adjusting downward for fuel and compression costs[79] and adjusting upward for BTU differentials.[80] After adjustment, the differential is 25.1¢/Mcf, which when added to Tennessee's current cost of gas from offshore Louisiana (23.2¢), results in a stated commodity value of gas at the wellhead of 48.3¢/Mcf.[81] This latter figure is, of course, the overall average price which Tennessee could pay for all Southern Louisiana purchases and still deliver gas to market on a basis competitive with other fuels. A single purchase, or group of purchases such as proposed here, at rates substantially about 48¢/Mcf could be made without adversely affecting inter-fuel competition.[82]

107. We consider this evidence, together with the balance of the record, in arriving at our decision herein.

RATE DETERMINATION

108. We conclude, based on a broad consideration of cost and noncost factors, after applying those standards which our experience indicates are of consequence, that service by Applicants should be certified at a rate of 45¢/Mcf. We find this rate to be just and reasonable, and we find that the present and future public convenience and necessity require certification at 45¢/Mcf. No one factor among those discussed in this Opinion is determinative of our decision. We have weighed all relevant evidence and reached our conclusion on the totality of what has been presented to us. We find that the increment of gas supply represented by the applications here, if made available at 45¢/Mcf, is the lowest cost supply source presently available to Tennessee.

PREGRANTED ABANDONMENT

109. Belco, in its application sought permission to discontinue service at the end of the ten-year term of its contract with Tennessee. Section 2.75(e) permits consideration of such a request.

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[76] Tr. 136 *et seq.*; Exhibit 5, Shantz.

[77] Initial Brief, pp. 12–14.

[78] Order 467, as amended, issued in Docket No. R–469.

[79] 6.9 percent; Tr. 160–161, Shantz Exhibit 5.

[80] Tennessee gas averages 1015 BTU; Tr. 160–161.

[81] A concise statement of the commodity value methodology is provided at pp. 20–21 of Texaco's Initial Brief. We append this material as Appendix F.

[82] Tr. 161.

110. Under Section 7(b) of the Act, the Commission may, after hearing, and upon finding that the available supply of gas is depleted to the extent that further service is unwarranted, or that the present or future public convenience or necessity permit abandonment, authorize discontinuance of service to the interstate market.

111. Belco presented no evidence in support of its request, and offers no argument in its briefs on this issue. It is clearly within our power to make a present determination of depletion of supply over time and the requirements of the present or future public convenience and necessity, given an adequate record. We have no factual basis for exercise of abandonment authority here, however, and Belco's application is therefore denied.

FIXED ESCALATIONS

112. Belco proposes certification of service under a contract calling for 1.5¢ annual escalations, while Tenneco and Texaco seek authorization for 1.0¢ annual escalations.[83] Staff proposes .5¢ annual escalations for each Applicant, concluding that such are required to compensate for future cost increases, replacement of equipment, installation of compression, and additional drilling on the tracts covered by the Tennessee gas purchase contract. We agree that escalations are necessary to compensate for future expenditures not included in an analysis of costs already incurred.

113. We conclude that the fixed escalations are proper. From the standpoint of present costs, we have seen that the cost of 1971 gas may be as high as 48¢/Mcf,[84] so that a sale at 45¢ produces a return on equity of only 12 percent. By this standard, annual 1.0¢ escalations over six years would produce an average return of 15 percent, clearly within the zone of reasonableness approved by the Courts.[85] The trend of cost increases also argues for the necessity of definite escalations. On this record our Staff has compiled a "new gas" costing study which reflects a current cost range of 28.27¢/Mcf—36.85¢/Mcf, while only two years ago, the Staff estimated in Southern Louisiana II that the then current cost range was 24.91¢/Mcf—26.68¢/Mcf.[86] In 1968, the Commission found then current costs to be in the range of 18.80¢/Mcf.[87] Quite clearly if costs continue to escalate at the same rate as they have from 1968 through 1972, a 1¢ annual escalation is just and reasonable, and will not return excess profits to the applicants.

114. A 1¢ annual escalation of a base rate of 45¢ is a 2.2 percent annual increase in the first year, but drops to a 1.6 percent increase in the twentieth year. We recognize that nationally the annual rate of inflation has been in the range of 5 percent.[88] While this trend will, we trust, be reversed, it is a present fact of life and its effects on costs must be acknowledged.

115. The fixed escalations are the only price protection available to the Applicants in view of our insistence that Section 2.75 applications be accompanied by a specific waiver of "all rights to seek future rate increases under Section 4 of the Natural Gas Act . . .",[89] and our requirement that Section 2.75 contracts contain no "area rate or FPC clauses."[90] By these provisions we seek for the consumer the protection of a long-term, determinable rate, which will not escalate because of cost fluctuations or supply incentives that the Commission might utilize in future industry-wide rate cases. Thus, if the Commission finds it necessary in any future proceeding to prescribe a national rate in excess of the rate approved for the Applicants here, consumers will pay no more for the 235 Bcf of gas reserves here committed. This long-term rate certainly is badly needed.

116. Two other factors must be considered in examining the escalation provisions, both factors having relation to the waiver requirements of Section 2.75 (m). First, as a matter of recent history, industry-wide rate increases at a rate

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[83] The difference in escalations is more apparent than real. Belco's gas has a BTU content of 1041 BTU/cubic foot, and its contract with Tennessee calls for BTU adjustments only above 1050 BTU. The Tenneco and Texaco contracts call for BTU adjustments above 1015 BTU. As a result, Belco's proposed 1.5¢ escalation results in a higher price to Belco (higher than the other applicants would get at 1¢ annual escalations) only in the fourth through the thirteenth year: Texaco and Tenneco will receive slightly higher rates in the first three years, and again in the fourteenth through twentieth years. On the whole, considering the full contract life, and the BTU adjustments, the escalations may be treated as the same, and we do so.

[84] See pp. 27–32, *supra.*

[85] See *Placid Oil v. F.P.C., supra; Hugoton-Anadarko Area Rate Cases, supra.*

[86] See Opinion 598, at pp. 46–59.

[87] See Opinion 546, at pp. 62–63.

[88] Tr. 1478; 2139.

[89] Section 2.75(m).

[90] Section 2.75(f).

greater than 1¢/year have been found necessary by this Commission.[91] From a rate for "old gas" of 18.0¢/Mcf set in September, 1968, an increase to 21.375¢/Mcf was necessary in July, 1971. From a rate for "new gas" of 18.5¢/Mcf in September, 1968, an increase to 26.0¢/Mcf was necessary in July, 1971. The upward trend in costs has apparently not ended.[92]

117. Secondly, to prosecute these applications, Texaco and Tenneco were required[93] to waive all contingent escalations in the price for "old gas" produced by them in Southern Louisiana, to which escalations they were entitled as a matter of right under Opinion 598, as recently affirmed by the Fifth Circuit Court of Appeals. Waiver of these escalations, totaling 1.5¢/Mcf over time, represents a substantial sacrifice to both Applicants, inasmuch as Tenneco's Southern Louisiana jurisdictional sales exceeded 36,000,000 Mcf in 1971, and Texaco's Southern Louisiana jurisdictional sales exceeded 385,000,000 Mcf in the same year.[94] While the dollar loss in revenue required by the waiver cannot be precisely quantified, Tenneco offered testimony that the loss to it would exceed $35 million over an estimated depletion period of 23 years. As already noted, Texaco has roughly ten times the Southern Louisiana production as Tenneco, much of which would be eligible for the Opinion 598 contingent escalations. By contrast, an annual fixed 1¢ escalation will produce, at most, an additional $200,000/year to Tenneco and Texaco,[95] or $4,000,000 to each producer over the full period of the escalations.

118. We are not so sanguine as to believe that companies as experienced as these have yielded two birds in the hand for one in the bush, as these figures would indicate. The uncertainty of when, if ever, the full range of the contingent escalations will take effect reflects that the escalations are, after all, contingent on the happening of future events. Accordingly, while we cannot conclude that the Waiver of contingent escalations on a large volume of production in return for fixed escalations on a smaller volume of production is an even trade, we can reason that the required waiver contributes to the justification for our approval of escalations here.[96]

119. Finally, we are constrained to recall that in approving a base load LNG import recently, we expressly approved flowthrough to the American consumer of periodic open-ended escalations for the Algerian producer.[97] The escalation there was tied to changes in certain BLS indices, and the Administrative Law Judge found that the escalation, at he end of the first full year of operation of the LNG project would produce a price increase of 1.88¢/MMBTU.[98] Our approval of the Algerian escalation has become final, with no appeal taken as to that aspect of the case. At a time when domestic resource development is of paramount importance, it would make little sense indeed for us to permit a foreign producer escalation rights but deny the same to domestic producers.

120. On balance, we are persuaded that the annual escalations proposed are just and reasonable, and certificates so authorizing are required by the present and future public convenience and necessity.

COLLATERAL ISSUES

121. Our findings and conclusions heretofore stated are, we believe, fully dispositive of the applications before us. Nonetheless, we deem it appropriate to address certain collateral issues raised on this record to the end that the parties, and any reviewing court, might better understand our approach to this case.

1. *Setting of "guideline" rates of future applicability*

122. AGD and Philadelphia argue that the Commission should announce its decision here as setting a prevailing rate which will hold firm for the next several years. Rate stability and the need to "cool" producer expectations are cited as the principal reasons for this policy.

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[91] *Cf.* Opinion 546, *Southern Louisiana I, supra,* with Opinion 598, *Southern Louisiana II, supra.*

[92] See Notice of Rulemaking, Docket No. R–389–B, issued April 11, 1973; 38 FR 10014.

[93] The same waiver was required of Belco, but since, according to the record this Applicant has no "old gas" production, in the Southern Louisiana area, the waiver has no dollar effect.

[94] *Sales by Producers of Natural Gas to Interstate Pipeline Companies, 1971;* (Federal Power Commission Office of Accounting and Finance, published October 1972).

[95] Deliveries from the Tenneco-Texaco block are estimated at 110,000 Mcf/day (Tr. 76).

[96] Belco's escalations will return dollar for dollar into Southern Louisiana exploration.

[97] Opinion 622–A, *Columbia LNG, et al.,* Docket No. CP71–68, et al., —— FPC ——, October 5, 1972.

[98] Initial Decision, p. 46, and Appendix A, thereto, p. 3.

123. Acceptance of this argument would convert this proceeding to an area rate case, with the consequent loss of flexibility and regulatory responsiveness which have characterized that form of regulation since its inception. In our judgment, we do not need Section 2.75 if it is but a vehicle for determination of industry-wide rates. If Section 2.75 is to be of help in overcoming the supply shortage it will be through an expeditious "supply project" approach as outlined at pp. 4–7 above.

124. The Commission is attempting to demonstrate to producers and potential producers that this is the time to expand the search for gas. The expectation factor referred to by these intervenors—that producers will withhold action today in the expectation that prices, and profits, will be higher tomorrow—is, we believe a factor that can be made to work in another way. Put more bluntly, if the producing industry is convinced that individual consideration of supply projects is now a reality and not a promise, producers response should be immediately affirmative. It must surely be obvious that Section 2.75 was initiated by the Commission, and it may be rescinded or modified by the Commission.

2. *The earmarking of funds.*

125. New York advances the belief that any Applicant under Order 455 should be required, as a condition in the certificate issued, to devote all revenues received in excess of the applicable area rate to exploration and development. This is not a new concept, having been advanced, and rejected, in Southern Louisiana.[99]

126. While we have recognized the desirability of earmarking additional revenues created by rate increases in certain instances[100], the Commission has never imposed such a condition in certificating new service. Those who argue for it here operate on the premise that any rate in excess of 26¢/Mcf is not justified, and accordingly, all revenues in excess of 26¢ should be devoted to a particular purpose. We cannot accept this basic premise. Our study of this record persuades us that an initial rate of 45¢ is proper, based on costs and non-cost factors. There is no "windfall" that requires special handling.

127. We believe any restriction on the Applicants' revenues[101] would be unwise as it is unnecessary. This Commission is not equipped to determine an exploration or development program for any producer or group of producers. If we attempt to compel expenditures of certain amounts in certain areas over a stated time span we will coerce geologic and management decisions that are beyond our ken. Sound management will see that gas revenues are reinvested in the search for gas if persuaded that such investment is a sound investment. Intrusion of additional regulation into exploration and development decisions is unwise.

3. *APGA's Motion to Strike.*

128. The American Public Gas Association (APGA) on March 15, 1973, filed an appeal from a ruling of Presiding Administrative Law Judge Nahum Litt in the above-entitled proceedings denying APGA's motion to strike evidentiary presentations by Staff and by Applicants. If the appeal is denied, APGA asks that it be granted 60 days in which to file rebuttal testimony.

129. APGA's appeal is directed to the cost evidence of Mr. Engel for the Staff and Mr. Sherwin for the Applicants, which has been previously discussed.

130. On March 8, 1973, APGA made a motion to strike this evidence.[102] After argument by Counsel, the Administrative Law Judge denied the motion and denied APGA's request for additional time to file rebuttal testimony.

131. As already noted[103] we find the area cost evidence relevant, but of limited usefulness.

132. In determining to accept the area cost evidence up-dating the data set forth in Opinion No. 598 we emphasize that we do not intend that these proceedings, or any others brought under Order No. 455, be transformed into an area rate proceeding. We think however, that the evidence presented by witness Engel and Sherwin helps demonstrate the need for rate flexibility and is some use in determining whether the rates proposed are lawful and whether the sales

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[99] See *Placid Oil* v. *F.P.C.*, *supra*, at pp. 32–34.

[100] See, e.g., Opinion 626, *Panhandle Eastern Pipeline Co.*, —— FPC ——, September 20, 1972.

[101] Belco's proposal for reinvestment is acceptable as being in the public interest and will be embodied in the certificate issued.

[102] Witness Engel: Tr. 316. Line 18 through Tr. 317. Line 4; Tr. 320, Line 22, through Tr. 326, Line 25, and Exh. 11. Witness Sherwin: Tr. 393, Line 9 through Tr. 413, Line 12 and Exh. 13.

[103] See pp. 20–26 *supra*.

should be certificated. We do not now wish to deprive ourselves of this assistance.

133. The Administrative Law Judge was correct in not granting APGA 60 days in which to file rebuttal testimony. To judge from its appeal, APGA appears to want the 60 days to run from the date we deny its request to strike the cost evidence. By notice of January 5, 1973, the Secretary provided that Staff's direct case be served on February 12, 1973, and rebuttal by Applicants be served on February 21, 1973. At the prehearing conference on January 17, 1973. Staff made known that it would file evidence to update the Opinion No. 598 data and Counsel for APGA asked for opportunity to respond to Staff's evidence. The Administrative Law Judge then ruled that by February 21, 1973, any intervenor might file rebuttal evidence limited to Staff's direct case. Witness Engel's evidence was actually filed February 9, 1973, and that of Applicants' witness Sherwin on February 21, 1973.

134. APGA did not file any rebuttal but at the hearing session on February 28, 1973, its Counsel stated that he intended to move to strike Staff's cost testimony, and if the motions were denied, he would ask for 60 days to respond. It was not until the hearing session of March 8, 1973, that the motion to strike was made and the 60 days was requested in the alternative. In denying both requests the Administrative Law Judge pointed out that APGA had already had over six weeks to make an evidentiary showing in response to Staff's presentation and that the Applicants had made their rebuttal presentation within the time allowed. APGA's rights have not been prejudiced.

4. *The call for a Texaco "Policy" witness.*

135. During the course of the hearing, Counsel for the New York Public Service Commission pointed out that Texaco had not presented the evidence of a policy witness and moved that its application be dismissed.

136. There was extensive argument on the record before the Administrative Law Judge as to the necessity of requiring a policy witness for Texaco. For example, Texaco argued that this proceeding should be decided upon broad economic evidence, but that it would be a mistake to have the Order No. 455 optional procedures evolve into extended evidentiary showings from company witnesses in every single application.

137. The Administrative Law Judge ruled that Texaco should supply a policy witness. He was of the opinion that it was his responsibility under the Commission's order of December 26, 1972, to make a full and complete record on all factors bearing on maintenance of an adequate and reliable supply of gas delivered at the lowest reasonable cost. He made the finding that the matter was no longer a question of the Administrative Law Judge's determining whether he should interfere with how the Applicant should try its case, but that the record would not be complete absent a knowledgable official from Texaco. He called upon Staff Counsel to draft a subpoena for his signature, but when Texaco indicated that it would honor a request for a witness if the Commission so ruled, no subpoena was issued.

138. Though the Administrative Law Judge is to be commended for his diligence, we find no need for a witness to speak to company policy. Texaco offered those witnesses, and those exhibits, which it thought necessary to support its application If this evidence is insufficient, our sanction is to deny certification. Here, however, we find that a sufficient record has been made. Presentation of a policy witness to speak to the specific matters mentioned in Judge Litt's certification [104] will add nothing to our deliberations. We grant Texaco's appeal.

The Commission further finds

(1) Applicants, Belco Petroleum Corporation, Texaco Inc., and Tenneco Oil Company, are each engaged in the sale for resale of natural gas in interstate commerce subject to the jurisdiction of the Commission and each is therefore,

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[104] The Administrative Law Judge certified this question to us :

"Is it necessary and in the public interest in the instant proceeding that a witness be supplied by Texaco, Inc., which is a party to one of the underlying contracts being construed (Exhibit 14), who (a) has personal knowledge of that contract, and (b) has knowledge as to the effect of a grant of a certificate upon the supply-price-demand-relationship, capital formation for it and the industry, the consequences upon it and the producing industry of a grant of a certificate, and whether a certificate which may ultimately be issued to it in the proceeding will provide appropriate protection to the relevant present and future public interest?"

Texaco offered evidence on these matters, and whether by witnesses in the company employ or not, the offer of testimony by such witnesses is binding on Texaco. Additional testimony would be cumulative at best, and we believe further delay in the disposition of these applications is unwarranted.

a "natural-gas company" within the meaning of the Natural Gas Act as heretofore found by the Commission.

(2) The sale of natural gas hereinbefore described, as more fully described in the applications in this proceeding, will be made in interstate commerce subject to the jurisdiction of the Commission; and such sale by each Applicant, together with the construction and operation of any facilities subject to the jurisdiction of the Commission necessary therefor, is subject to the requirements of Subsections (c) and (e) of Section 7 of the Natural Gas Act.

(3) Each Applicant is able and willing properly to do the acts and to perform the service proposed and to conform to the provisions of the Natural Gas Act and the requirements, rules, and regulations of the Commission thereunder.

(4) The sale of natural gas by each Applicant is required by the public convenience and necessity and certificates therefor should be issued as hereinafter ordered and conditioned.

(5) It is necessary and appropriate in carrying out the provisions of the Natural Gas Act that the contracts submitted by each Applicant should be accepted for filing as its FPC gas rate schedule.

(6) The rate for initial service proposed by each Applicant is just and reasonable, based upon the costs of providing such service, and such rate is required by the present and future public convenience and necessity.

(7) The rate for initial service proposed by each Applicant is just and reasonable, based upon non-cost factors as hereinabove discussed, and such rate is required by the present and future convenience and necessity.

(8) The rate for initial service proposed by each Applicant is just and reasonable, based upon the cost of providing such service, and based upon non-cost factors as hereinabove discussed, and such rate is required by the present and future public convenience and necessity.

(9) The annual escalations proposed by each Applicant are in the public interest, and are required by the present and future public convenience and necessity.

(10) Good cause exists for waiver of the intermediate decision as moved by Tennessee Gas Pipeline Company, in that the contract between Belco and Tennessee, originally terminable on April 1, 1973, will terminate on May 30, 1973, and in that immediate guidance from the Commission is necessary with respect to the prosecution of more than twenty additional applications now pending under Section 2.75 of our Regulations.

(11) There has been no adequate showing that the public interest would be served by grant of Belco's Motion to Sever or APGA's Motion to Strike.

(12) Good cause does not exist for the ordering of further hearings to receive additional evidence from Texaco Inc. in that such evidence would be only cumulative of testimony already presented.

The Commission Orders

(*a*) A certificate of public convenience and necessity is issued authorizing Texaco Inc. to sell natural gas in interstate commerce to Tennessee at an initial rate of 45.0¢ per Mcf at 15.025 psia, subject to BTU adjustment, together with the construction and operation of any facilities subject to the jurisdiction of the Commission, necessary therefor, and authorizing fixed annual escalations, as applied for, in the amount of 1¢/Mcf per year for twenty years, upon the terms and conditions of this opinion and order and specifically limited to such sale and facilities.

(*b*) The contract dated October 6, 1972, is accepted for filing effective the date of initial delivery under the authorization granted herein. Texaco shall advise the Commission of the date of initial delivery within 10 days thereof.

(*c*) A certificate of public convenience and necessity is issued authorizing Tenneco Oil Company to sell natural gas in interstate commerce to Tennessee at an initial rate of 45.0¢ per Mcf at 15.025 psia, subject to BTU adjustment, together with the construction and operation of any facilities subject to the jurisdiction of the Commission, necessary therefor, and authorizing fixed annual escalations, as applied for, in the amount of 1¢/Mcf per year for twenty years, upon the terms and conditions of this opinion and order specifically limited to such sale and facilities.

(*d*) The contract dated October 12, 1972, is accepted for filing effective the date of initial delivery under the authorization granted herein. Tenneco shall advise the Commission of the date of initial delivery within 10 days thereof.

(*e*) A certificate of public convenience and necessity is issued authorizing Belco Petroleum Corporation to sell natural gas in interstate commerce to

Tennessee at an initial date of 45.0¢ per Mcf at 15.025 psia, subject to BTU adjustment, together with the construction and operation of any facilities subject to the jurisdiction of the Commission, necessary therefor, and authorizing fixed annual escalations, as applied for, in the amount of 1.5¢/Mcf per year for ten years, upon the terms and conditions of this opinion and order and specifically limited to such sale and facilities.

(f) The contract dated June 8, 1972, is accepted for filing effective the date of initial delivery under the authorization granted herein. Belco shall advise the Commission of the date of initial delivery within 10 days thereof.

(*g*) The certificates granted in paragraphs (A), (C) and (E) above are not transferable and shall be effective only so long as Applicants continue the acts or operations hereby authorized in accordance with the provisions of the Natural Gas Act and the applicable rules, regulations, and orders of the Commission.

(*h*) The certificate granted in paragraph (E) above is expressly conditioned as follows:

1. For a period of ten years, Belco will invest in exploration and development in the Southern Louisiana Area, as defined in Section 154.105(k) of our Regulations, all amounts Belco receives under the certificate herein issued in excess of 26¢/Mcf.

2. Such expenditure will be in addition to Belco's present five-year average of $2 million per year for exploration and development in Southern Louisiana.

3. At least $12 million of such funds shall be expended by Belco in the offshore federal domain, and all natural gas found as a result thereof shall be dedicated to the interstate market; but it is provided that such $12 million offshore expenditure may be credited with onshore exploration and development expenditures if gas is found through such onshore activities and sold by Belco in interstate commerce.

4. Ninety days after the close of Belco's fiscal year, Belco shall report annually to the Commission concerning expenditures made hereunder during the previous fiscal year, providing sufficient information, under oath, to permit Commission review for compliance with the conditions imposed in this paragraph (H).

5. If at the end of ten years after commencement of deliveries under the certificate issued in paragraph (E) above Belco has not spent a total of $32 million in exploration and development in the Southern Louisiana Area (including $12 million in the federal domain offshore subject to the proviso set forth above), Belco will refund such funds as are unspent to Tennessee, for flow-through by Tennessee to its jurisdictional customers.

6. The ten year period for Belco's expenditures as herein set forth may be extended for causes force majeure, or for operational or mechanical difficulties beyond Belco's control.

(*i*) Belco's Motion to Sever, and APGA's Motion to Strike are overruled; Tennessee's Motion for Waiver of the intermediate decision is granted; Texaco's appeal from the Administrative Law Judge's order requiring production of a witness is granted; Belco's request for pregranted abandonment is denied; any and all other not herein specifically granted is denied.

(*j*) Pursuant to Section 2.75(m) of our Regulations acceptance of these certificates shall constitute waiver by each Applicant of: (1) all rights to seek future rate increases under Section 4 of the Natural Gas Act with respect to the contract submitted, other than price escalations, if any, as certificated by the Commission; and (2) all rights to contingent adjustment of flowing gas rates as provided by the Commission in area rate decisions heretofore decided, for flowing gas which each seller Applicant produces in the same geographical pricing area as the pricing area of the production covered by the application made under this Section.

(*k*) If any provision of this opinion and order, or the application of such provision to any person or circumstance, shall be held invalid, the remainder of this opinion and order, and the application of such provision to persons or circumstances other than those as to which it is held invalid, shall not be affected thereby.

By the Commission. Chairman Nassikas dissenting in part and concurring in part filed a separate statement appended hereto.

KENNETH F. PLUMB, *Secretary*.

Appendix A

WITNESS ENGEL

[Estimated nationwide cost of finding and producing nonassociated gas]

Cost components	Current low	Current high
Successful well costs	4.62	4.99
Recompletions and deeper drilling	.20	.20
Lease acquisitions	1.97	2.86
Other production facilities	1.04	1.13
Subtotal	7.83	9.18
Dry hole expense	2.88	3.12
Other exploration	1.63	2.36
Exploration overhead	.57	.69
Subtotal	5.08	6.17
Production operating expense	3.10	3.10
Return at 15 percent and 10.5 years		14.30
Return at 15 percent and 9 years	10.44	
Return on working capital	.67	.90
Net liquid credit	(3.89)	(3.89)
Regulatory expense	.20	.20
Subtotal	23.43	29.96
Royalty at 15 percent	4.13	
Royalty at 16 percent		5.71
Total at 14.65 lb/in ^{2} a	27.56	35.67
Total at 15.025 lb/in ^{2} a	28.27	36.58

Appendix B

WITNESS SHERWIN

[Estimated range of cost of nonassociated gas]

	Cents per thousand cubic feet at 14.65 lb/in^{2}a	
	Low	High
1. Successful wells	5.02	5.70
2. Recompletions and deeper drilling	.20	.20
3. Lease acquisitions	3.71	4.00
4. Other production facilities	1.35	1.53
5. Dry holes	3.22	3.66
6. Geological, geophysical, and other exploration	2.25	2.25
7. Exploration overhead	.63	.63
8. Production operating expenses	3.10	3.10
9. Return at 15 percent (11 years)	16.80	18.69
10. Return on working capital ta 15 percent	1.09	1.16
11. Net liquid credit	(3.60)	(3.85)
12. Regulatory expense	.20	.20
13. Subtotal	33.97	37.27
14. Royalty at 16 percent	6.47	7.10
15. Total	40.44	44.37

Appendix C

Estimated cost using 1971 data:

Successful well costs	7.29
Lease acquisition	3.10
Other production facilities	1.65
Subtotal	12.04
Dry hole expense	4.51
Other exploratory expense	3.60
Exploration overhead	1.04
Subtotal	9.15
Production and operating expense	3.10
Return on investment at 15 percent	18.96
Return on working capital at 15 percent	1.03
Net liquid credit	(3.89)
Regulatory expense	.20
Subtotal before royalty	40.59
Royalty at 16 percent	7.73
Total, at 14.73 psia (cents/Mcf)	48.32

Item, computation, and source	*Cost*
Successful well costs: \$27.64/ft. (1971 JAS) ÷ 379 Mcf/ft. (1971 AGA-AAPG)	\$7.29
Lease acquisition: \$7.29 (line 1) × .4257 (1971 L.A.C. ÷ 1971 Cost of Prod.)	3.10
Other production facilities: \$7.29 (line 1) × .226 (Opin. 598)	1.65
Subtotal	12.04
Dry hole expense: \$15.33/ft. (1971 JAS) ÷ 379 Mcf/ft	4.51
Other exploration: \$3.10 (line 2) × 1.1619 (1971 Other Explor. ÷ 1971 L.A.C.)	3.60
Exploration overhead: [\$4.51 (line 5) + 3.60 (line 6)] × .1279 (1971 Ex. Overhead ÷ 1971 Dry Hole + 1971 Other Ex.)	1.04
Subtotal	9.15
Production expense: Opinion 598	3.10
Return @ 15%, 10 years [\$12.04 (Line 4) × 10.5 × 15] \$1.54=9.15 (Line 8×⅛×1.336 (Opin. 598) \$0.65=3.10 (Line 9×⅛×1.689 (Opin. 598) \$4.65=3.10 (Line 2) × 1.5 (Opin. 598)	18.96
Return on working capital: [\$1.54 (line 11)+0.05 (line 12)+4.65 (line 13)]×0.15	1.03
Liquid credit: Opinion 598	−3.89
Regulatory expense: Opinion 598	.20
Subtotal	40.59
Royalty at 16%: [\$40.59 (line 17)÷(1−.16)]−40.59	7.73
Total @ 14.73 psia	48.32
Total @ 15.025 psia	49.29

Appendix D

Determination of return component at 45 cents mcf at 15.025 psia (1971 test year costs)

	Cents
Assumed sales price Mcf (45¢ @ 15.025=44.12¢ @ 14.73 psia)	44. 12
Less cost factors:	
Successful well costs ($27.64÷379)	7. 29
Lease acquisition (7.29×0.4257)	3. 10
Other production facilities (7.29×0.226)	1. 65
Dry hole expense ($15.83÷379)	4. 51
Other exploration (3.10×1.1619)	3. 60
Exploration overhead (4.51+3.60×0.1279)	1. 04
Production expense	3. 10
Regulatory expense	. 20
Subtotal of costs	24. 49
Royalty (16 percent of 44.12 cents)	7. 06
Liquid credit	−3. 89
Total deductions	27. 66
Return component	16. 46
Return on working capital ($\frac{1}{20}$×16.46)	. 82
[Ratio of return on invested capital to return on working capital —19:11]	
Return on invested capital ($\frac{19}{20}$×16.46)	15. 64
Rate of return on working capital (.82=6.84×rate of return) (percent)	12. 0
Rate of return on invested capital (15.64=12.04×10.5×rate of return (percent)	12. 4

Appendix E

Determination of return component at 45 cents/Mcf at 15.025 psia (staff cost estimate of 38 cents/Mcf)

	Cents
Assumed sales price: (45 cents Mcf at 15.025=43.89 cents Mcf at 14.65 psia)	43. 89
Less cost factors at 14.65 psia:	
a. Successful well costs	4. 99
b. Recompletions and deeper drilling	. 20
c. Lease acquisition costs	4. 00
d. Other production facilities	1. 13
e. Dry hole expense	3. 66
f. Other exploration	2. 36
g. Exploratory overhead	. 69
h. Production expense	3. 10
i. Regulatory expense	. 20
Subtotal	20. 33
j. Royalty (16 percent of 43.89 cents)	7. 02
k. Liquid credit	3. 89
Total deductions	23. 46
Return component	20. 43
Working capital component ($\frac{1}{15}$×20.43) [Ratio of return on invested capital to return on working capital —14:1]	1. 36
Invested capital component ($\frac{14}{15}$×20.43)	19. 07
Rate of return on working capital (1.36=7.77×rate of return) (percent)	17. 5
[7.77=6.00 (Item C×1.5)+1.12 [6.71 (e+f+g)]×$\frac{1}{8}$×1.336+.65 (h×$\frac{1}{8}$×1.689)]	
Rate of return on invested capital (19.07=10.32−$\frac{1}{2}$×.2×10.5×rate of return) (percent)	17. 8
[10.32=Item a+Item b+Item c+Item d]	

Texaco's Witness Schantz presented an analysis of energy prices in the market area served by Tennessee (Tr. 2:136–64; 166–72; Ex. 5, 6). This study compared 1972 fourth quarter prices of substitutable forms of energy in 16 key metropolitan areas (or states) served by Tennessee or its resale customers.* The sectors of this market examined by Mr. Schantz were residential house heating use; total residential use; commercial use; industrial use; main line industrial sales by interstate pipelines in states included in Tennessee's market area; and energy costs reported by electric utilities.** For each sector, composite price differentials were calculated, weighted by relevant volumes, between the price of gas and the price of relevant substitutable energy forms (Tr. 2:146). These differentials were first derived for various "submarket systems" which Mr. Schantz defined as the market of a pipeline purchaser from Tennessee or the market of a distributor purchasing directly from Tennessee (Tr. 2:147–48). Finally, the price differentials, after a further volumetric weighting process, were determined for the entire Tennessee market (Tr. 2:148–50). Through this analysis, it was determined that, as of the fourth quarter of 1972, the retail price of gas in the Tennessee market area was 43 cents per MMBtu below substitutable energy sources for the combined residential and commercial sectors, 26 cents per MMBtu below the residential, commercial and firm industrial sectors, and 48 cents per MMBtu below the total gas market (Tr. 2:150).

Belco Petroleum Corporation, Agent, *et al.* Docket Nos. CI73–293, *et al.*

(Issued May 30, 1973)

Nassikas, Chairman, *dissenting* in part and *concurring* in part:

Our April 11, 1973 order directed the Administrative Law Judge to transfer the record in these proceedings to the Commission and we stated therein (mimeo. at 6):

"If the record as it stands is sufficient, we will then be able to issue a timely final decision. On the other hand, we will remand the record if further evidence is necessary for a proper determination of the issues in this proceeding."

After examination of the record certified to us and perusal of the briefs filed in this proceeding, I would remand the case for an initial decision by the Presiding Judge concerning the justness and reasonableness of the proposed 45¢ per Mcf contract rate and for additional cost evidence relevant to the proposed rate.

Since the *Natural* decision,[1] this Commission has been required under the Natural Gas Act to prescribe just and reasonable rates on the basis of costs. Applying this mandate to the applications in this proceeding and based upon the record evidence therein, I would find that a 35¢ per Mcf price would be just and reasonable in this case. Accordingly, I dissent from the allowance of a 45¢ rate[2] unsupported by credible cost evidence.

I concur in principle with the majority's finding's concerning workable competition, to the extent that the issue is germane to resolution of the three applications before us. Much of the evidentiary presentation concerning market structure is directed at whether or not regulation of producers should continue. However, the Natural Gas Act, as interpreted by the Supreme Court, resolves that proposition and national market structure is irrelevant to this adjudicatory proceeding. On the other hand, inasmuch as the issue of workable competition has escalated beyond all proportions in this proceeding, the issue should be addressed.

I

The staff's 35¢ per Mcw cost-based rate recommendation is, in my judgment, the most persuasive and credible evidence upon which to prescribe just and reasonable rates. However, I would remand for the Presiding Judge to render a decision after receiving further cost evidence in support of the proposed rate. As an appellate body, we are at a disadvantage in assigning probative weight to conflicting testimony, whereas the Presiding Judge is in a better position to judge the credibility and demeanor of those witnesses as a basis for his initial findings. This is particularly so when this is the first major contested proceeding under Section 2.75 and involved some 3,000 pages of transcript and 32 exhibits. After an initial decision, the Commission, in its appellate function, could review those findings in a considered judicial atmosphere, rather than issue a decision under time constraints imposed by the applicants.

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* Ex. 5, Sch. 2 sets forth the 16 key metropolitan areas (or states) served by Tennessee or its resale customers in 1971 which represent the dominant markets with respect to Tennessee's sales for resale. Part A of Sch. 2 sets forth Tennessee's sales to the 7 other pipeline suppliers for resale to distributors. Part B of Sch. 2 sets for Tennessee's sales to the 10 dominant distributors for resale to consumers. The sales set forth in Parts A and B represent 1,046.9 billion cubic feet or 83.9% of total transmission sales for resale by Tennessee in 1971. See Tr. 2 : 137.

** Tr. 2 : 143 ; Ex. 5, Sch. 11 (residual house heating) ; Tr. 2 : 144 ; Ex. 5 Sch. 12 (total residential use) ; Tr. 2 : 144–45 ; Ex. 5, Sch. 13 (commercial use) ; Tr. 2 : 145 ; Ex. 5, Sch. 14 (industrial use) ; Tr. 2 : 145 ; Ex. 5, Sch. 15 (main line industrial sales by interstate pipelines in states included in Tennessee's market area) ; Tr. 2: 146 ; Ex. 5, Sch. 16 (energy costs reported by electric utilities).

[1] *F.P.C.* v. *National Gas Pipeline Co.*, 315 U.S. 575 (1942).

[2] Adding escalations, the average rate for the Texaco and Tenneco contract would be 55¢ per Mcf (1¢ per Mcf per year for twenty years) and 52.5¢ per Mcf for the Belco contract (1.5¢ per Mcf for ten years).

The staff presentation was based upon the current nationwide cost of non-associated gas and utilized the costing methodology just recently reaffirmed by the Fifth Circuit[3] and used by the Commission in its area rate opinions. I decline to add 10¢ to the 35¢ cost-based price on the basis of "speculative quantification of non-cost elements."

Placid, supra. at 42. The evidence does not justify a zone of "reasonable deviation" from costs of this magnitude.[4]

The majority, on the other hand, by adjustments made to staff's cost presentation (which adjustments are not supported by substantial evidence), in lieu of direct quantification of non-cost elements, attains an end result of "costs in the range of 38-48 cents per Mcf." However, the predicate for achieving this end-result is utilization of a 1971 test-year approach for which no support can be found in the record before us. The majority uses a single year's actual productivity figure, i.e. 1971, which assumption inflates other cost components. It is difficult for me to ignore the evidence of expert witnesses in this case, and in prior area rate cases, advocating use of average productivity over a certain timeframe which conclusions have been judicially affirmed.[5] These contracts are for long-term sales and should not be judged by the arbitrary selection of a particular year's results. Many of the actual production investment costs, e.g. lease acquisition, geolcgical and geophysical, exploratory overhead, may have been incurred prior to 1971.

In the Commission's previous decisions involving estimated "productivity" (e.g., Opinion 468, Permian I: Opinion 546, Southern Louisiana I; Opinion 598, Southern Louisiana II, and subsequent area rate decisions), the calculation was made by averaging the relationship over an extended period of years between annual additions to non-associated gas reserves and annual successful gas well footage drilled. In the instant majority opinion, however, this well established procedure is rejected in favor of a so-called "test year" approach which calculates "productivity" by dividing the reserves added in the single year 1971 by the footage drilled in that year. This major departure from the well established procedure is sufficient in itself to account for the entire difference between the majority's cost estimate of 48¢ per Mcf and the much lower range of estimates by the staff.

The majority's "test year" productivity calculation violates the elementary standards of reasonableness for a cost study that is intended as a point of departure in determining a proper rate level. The existence of a time lag between drilling and reported proved reserves is universally recognized. The results of the wells drilled in 1971 will be reflected for the most part in reserves added in subsequent years; conversely, the reserves reported as added in 1971 largely reflect the drilling in previous years. To allow for this time lag, the Commission has always resorted to long-term averaging and has consistently refused to use a productivity estimate based on a single year's data, even though it accepted the "test year" approach for other cost components.

The majority's productivity calculation also ignores the fact that reported reserve additions in 1971 are underestimated because, as explained by the A.G.A. Reserves Committee, "some reserves resulting from drilling on acreage leased in the December 1970 Federal Lease Sale in Offshore South Louisiana are not included because the A.G.A. Reserves Committee did not have sufficient data upon which it could base an estimate of proved reserves as of December 31, 1971."[6]

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[3] *Placid Oil Co., et al.* v. *F.P.C.*, April 16, 1973.

[4] In *Placid*, a reasonable deviation in costs of 4 to 5¢ was affirmed (Slip Op. at 40). In Texas Gulf Coast, Opinion No. 595, we found the zone of reasonableness to be in the 4¢ range (mimeo. para. 93). The latter opinion, referred to by Dr. Wilson in this case stated: "We shall try to avoid confusion incident to an effort to quantify 'non-cost' elements of 'cost', as far as possible. Once 'non-cost' elements are quantified for practical purposes their differentiation from 'costs' is semantic only." (Mimeo. para. 10), and we did not attempt "quantification of non-cost facts, but rather have attempted to define cost in economic terms to include such considerations as the incentive necessary to elicit additional supplies of natural gas, competitive consequences upon the industry, and the need for adequate capital to finance further exploration and development." (Mimeo. para. 92)

[5] Either straight average or moving agerages for a period of years have been used in every prior producer area rate case since *Permian I.* E.g. 34 FPC at 197, 379.

This underestimate is compounded by another major shortcoming of the majority's one-year calculation. Starting in 1966 the A.G.A. Reserves Committee has reported "revisions" as a separate component of each year's reserve additions. These "revisions" apply to estimated reserve additions in previous years, but they are reported as an adjustment of the current year's reserve additions.[7] During 1966–1968 the "revisions" ranged between 3.5 billion and 4.8 billion per year added to proved non-associated gas reserves. During the following years, 1969–1971, however, the "revisions" were *minus* quantities. In 1971, the majority's "test year," the reported reserve additions were *reduced* by 1.1 billion Mcf because of negative "revisions."[8] This reduction has little if any direct relationship to the productivity of drilling in 1971. Omitting the "revisions" from the 1971 calculations raises the productivity to 501 Mcf,[9] compared with 379 Mcf used by the majority.

A practicable method of handling the statistical lag problem and also the problem of statistical revisions, which are positive in some years, and negative in others, is to calculate the average relationship between footage drilled and reserves added over a sufficiently long period to match drilling effort with drilling results, as was done in staff's 35¢ cost estimates.

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The majority's cost findings, i.e. 48¢ per Mcf, is based on nationwide data and equates to a national cost for gas-well gas. The parties to this proceeding litigated the case on the basis of national averages. However, if we are to utilize the "supply project" concept (endorsed here for the first time by the majority), we should not look to national averages. We should either obtain evidence as to (1) actual unit costs in the South Louisiana area (much like a 1971 flowing gas study, as was done for 1969 in Docket No. AR69–1) or (2) individual project costs, i.e. actual unit costs of the three producer-applicants.[10] Furthermore, if this project is to be compared to LNG and SNG projects, as proposed by the majority, applicable principles of the two cases decided by the Commission (Opinion No. 622 and Opinion No. 637) would compel Tennessee to pay for gas based on actual costs[11] and the 45¢ gas should be incrementally priced and such gas volumes should be exempt from curtailment.

In our most recent area rate opinions, we found a 15 percent rate of return to be reasonable. Staff's 35¢ recommendation is so premised. However, at 45¢ per Mcf, the producers will be receiving a 27.5 percent rate of return, as testified to by Dr. Wilson.[12]

Opinion No. 598 (issued July 15, 1971) prescribed a 26¢ per Mcf rate for new gas for South Louisiana. The major producers, including Tenneco and Texaco, agreed that the 26¢ rate would "provide incentive for the exploration for and development of gas reserves in the Southern Louisiana area."[13] Opinion No. 598

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[6] See footnote f to Table I, *Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas in the United States and Canada and United States Productive Capacity as of December 31, 1971,* American Gas Association, American Petroleum Institute, and Canadian Petroleum Association, page 114. Identical footnotes appear in Tables II–VI.

[7] *Ibid.*, page 104.

[8] Table VIII, *ibid.*, page 121.

[9] Using successful gas-well footage as reported in *World Oil,* rather than AAPG.

[10] As for this latter suggestion, this would not mean a return to individual producer regulation, inasmuch as Section 2.75 is an optional, rather than the primary, method for producer rate regulation.

[11] As we indicated in Opinion Nos. 622 and 622–A, actual costs do not necessarily equate to "lowest reasonable cost."

[12] Using Appendix E, based on 45¢ and using all the cost assumptions of the majority, adjusting only for the depletion period indicated in this record (Belco, 16 years; Texaco and Tenneco, 11 years), rather than using 10.5 years (para. 71 and Appendix D), the actual rate of return would approximate 24%, rather than 17.8%.

[13] Opinion No. 598 (mimeo. para. 106) called particular attention to Section 11 of the settlement proposal, which stated:

"Each producer individually represents to the Commission that the ceiling prices and other provisions contained herein provide incentive for the exploration for and development of gas reserves in the Southern Louisiana area. In view of the nature of producing and finding hydrocarbons, it is unrealistic to expect producing companies to guarantee that the ceiling prices and other provisions contained herein will elicit a specific supply of gas; however, it is believed that the ceiling prices and other provisions contained herein will make funds available to the producing industry and create a regulatory atmosphere which should provide an incentive for a substantial increase in exploratory and developmental activities and make a major contribution to bringing forth additional supplies of gas from the Southern Louisiana area to meet the demands of all consumers supplied by this area."

was affirmed in full less than two months ago as to the new gas rate. That settlement also contained a moratorium, agreed to by the major producers, including Tenneco and Texaco, on increased rate filings, above the just and reasonable rates prescribed by Opinion No. 598 for a period of five years, terminating on October 1, 1977. The moratoria provisions were sustained in full by the court in *Placid* (Slip Op. at 56).

Based upon the evidence in this record, I cannot reconcile a 45¢ per Mcf price in 1973 with a 26¢ price in 1971, which latter rate was affirmed on the basis of cost evidence through 1969. The majority asserts that cost evidence through 1971 supports a 73 percent increase in the price to 45¢. However, the Fifth Circuit[14] held that:

"The 26¢/Mcf rate for gas delivered under a post October 1, 1968 contract which FPC adopted in Op: 598 clearly falls within the range of cost estimates which the evidence discloses. Accordingly, FPC properly declined to make what would be a necessarily speculative quantification of non-cost, elements. The rates for so-called 'new' gas are sustained."

Staff witness Engel estimated costs ranging from 28.27¢ per Mcf to 36.58¢ per Mcf, depending upon the productivity figure, and representing about a 4¢ range, upward or downward from the average cost computation. Engel's presentation was an update of his evidence in Opinion No. 598 to which the Commission made certain adjustments. Beginning from Opinion No. 598 findings, and updating through 1971[15] that judicially affirmed costing methodology results in a cost estimate of 32.60¢ per Mcf, or about 15¢ or 40 percent less than what the majority's 48¢ rate purportedly derived after Opinion No. 598 adjustments. My finding of a 35¢ just and reasonable rate is squarely based upon the cost principles affirmed in *Placid*. The majority's approval of 45¢ is derived from a cost methodology which in effect quantifies speculative non-cost elements rejected by *Placid*.

II

Almost one-half of the gas reserves contracted for in these proceedings involved Tenneco and Tennessee, a parent and its affiliate.[16] The contract prices entered into by Tennessee with Belco and Texaco do not create a presumption that arms-length bargaining existed in the contract price with Tennessee's parent. The record does not present the clear preponderance of the evidence required to support the justness and reasonableness of any parent-affiliate transaction.[17] The 45¢ price found to be "just and reasonable" by the majority could hardly be disallowed in a future Tennessee rate case, so that the increase is in fact being passed on to the pipeline customers.

The majority indicates that this 45¢ gas is the lowest cost supply source presently available to Tennessee. Inasmuch as this gas supply is located in the federal domain, subject to the jurisdiction of the Federal Power Commission, there is no "potential diversion" to intrastate purchasers.

In determining the public interest, it is appropriate to measure the impact of these rates upon Tennessee's consumers. Based upon the three contracts at 45¢ plus escalations, gross revenues will approximate $31.5 million to Belco, $67.4 million to Tenneco, and $28.9 million to Texaco. If these same volumes were dedicated under the provisions of Opinion No. 598, assuming automatic escalations and allowing for the benefit of contingent escalations, gross revenues would be $16.2 million for Belco, $33.3 million for Tenneco and $17.0 million for Texaco. In other words, consumers will be generating revenues above area rates for these three producers aggregating more than $61 million (Belco, $15.3 million; Tenneco, $34.1 million; Texaco, $11.9 million). While producers are not compelled to commit to the interstate market at area rates, it is equally true that regulation does not permit prescription of rates at unreasonable levels proposed by producers. Otherwise, the regulatory process would be relegated to the position of sanctifying producer-controlled price levels, rather than the just and reasonable levels, directed by the Congress in the Natural Gas Act as interpreted by the courts.

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[14] *Placid, supra.* Slip Op. at 41–42.

[15] Average during the period 1946–1971. See Opinion No. 598 (mimeo. paras. 116, 121).

[16] Tenneco and Texaco are also joint owners of the leases underlying their respective sales contracts with Tennessee (Exhibit 32, Schedule 2–A). Tenneco, which obtained the four blocks in the December 15, 1970 lease sale, subsequently sold a 25 percent interest to Texaco in Blocks 255 and 272 East Cameron (Serial Registers, OCS–G–2040 and 2047) and a 50 percent interest to Texaco in Blocks 254 and 271 East Cameron (Serial Registers, OCS–G–2039 and 2046). See Exhibit C of Item B and Tr. 384 incorporating by reference those Serial Registers.

[17] *Cf. Western Distributing Co.* v. *P.S.C. of Kansas*, 285 U.S. 119 (1932); *Florida Gas Transmission Co.* v. *F.P.C.*, 362 F. 2d 331 (5th Cir 1966).

Belco has agreed to reinvest all amounts received under its contract above the area rate in future exploration and development in the South Louisiana area. These excess amounts are estimated to be $1.2 million per year over and above the average $2 million annual expenditure by Belco. See Opinion No. 649, George Mitchell, February 21, 1973, and Opinion No. 626, Panhandle, September 20, 1972. This type of condition could well offset some of the cost evidentiary deficiencies in support of a 45¢ rate; however, Tenneco and Texaco have not proposed such reinvestment and, in fact, resist such conditions.

III

There are numerous applications pending before us under our optional certification procedure at 35¢ per Mcf, and numerous others ranging from 35 to 45¢ per Mcf, and some higher. Irrespective of the majority's disclaimer to the contrary, the approval of these three applications today may well trigger escalations in such applications, establish a "minimum" floor from which all future applications under optional pricing will depart, set the scenario for a new national gas rate at a minimum of 45 cents per Mcf, and seriously impair our presently effective area rate structure.

The majority attempts to buttress their position by referring to regulatory lag in setting industry-wide regulations as a justification for approval of these optional certificate applications. There is no substance to such a contention on the eve of R–389–B, which, if adopted, contemplates annual rate reviews, industry-wide, and would prescribe rates on the basis of the most recent up-dated cost evidence.

The Commission is precluded by the Natural Gas Act from setting just and reasonable rates for natural gas producers either solely upon the basis of a negotiated contract price or the commodity value of natural gas. The Natural Gas Act, as interpreted by the courts, compels the prescription of rates on the basis of costs.[18] However desirable it might be to utilize market forces, independent of cost considerations, to determine rates, the Congress has not authorized this kind of regulation. To the contrary, the Congress has directed the Federal Power Commission to determine just and reasonable rates for producers on the basis of costs. Until Natural Gas Act is amended, the Commission cannot prescribe rates based on market determinations of commodity value, isolated from applicable cost considerations.

IV

Staff witness Dr. John Wilson presented extensive evidence, both through testimony and exhibits, concerning industry structure and its impact upon market conditions and the prices of alternate fuels, supplemental gas sources and other contract prices. The staff, and particularly Dr. Wilson, assumed an active role through direct evidentiary presentation and cross-examination of other witnessses, in representing the public interest in this proceeding. Such a role is required for we cannot rely upon counsel for private interests, whether through compromise or in advisory proceedings, to represent the public interest. The public interest should be sponsored by staff, independently of the claims of private litigants.

The Majority's observation in paragraphs 26, 27 and 28 that Dr. John Wilson's "mode of presentation" was unfair is not well taken. (Also see paras. 51, 53–55). Dr. Wilson's testimony and exhibits were fairly presented and there was a "fair opportunity to be heard on those issues." The Administrative law Judge granted a fair opportunity for cross examination as well as giving the producers the opportunity to sponsor a rebuttal witness (Dr. Sherwin) and to present Exhibit 37 in response to material in Exhibit 33.

In my opinion, the Majority's criticism is unsupported by the record of the proceedings in this case. In any event, the Majority agrees that Dr. Wilson's testimony is not "prejudicial to the applicants, nor does it require further rebuttal." If the Majority is concerned about the fairness of the proceedings relating to Dr. Wilson's testimony, they should have adopted my recommendation to remand this proceeding to the Administrative Law Judge for further hearing. After all, Dr. Wilson's testimony is relevant to the Majority's decision to depart from traditional cost concepts in prescribing a 45-cent rate—even if irrelevant to my determination of a cost based rate of 35 cents.

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[18] *F.P.C.* v. *Hope Natural Gas Co.*, 320 U.S. 591, 611 (1944); *F.P.C.* v. *Natural Gas Pipeline Co.*, 315 U.S. 575 (1942); *City of Chicago* v *F.P.C.*, 458 F. 2d 731, 750 (D.C. Cir. 1971), cert. denied, 405 U.S. 1074 (1972); *City of Detroit* v. *F.P.C.*, 230 F. 2d 810 (D.C. Cir. 1955), cert. denied, 352 U.S. 829 (1956).

Regardless of the fact that I am not persuaded by Dr. Wilson's testimony that the gas industry is anticompetitive, I defend his right and the right of the professional staff of this Commission to testify freely and independently in regulatory proceedings without being subjected to collateral attack by the Commission for expressing views antithetical to our own.

There is no question that the parties to this proceeding have had a fair trial and the Administrative Law Judge has diligently protected the interests of all parties.

Much of Dr. Wilson's evidence concerning market structure is irrelevant to the precise applications of the case at bar. For instance, those portions of Dr. Wilson's testimony, e.g. joint ventures in exploration and development in the global search for hydrocarbons, leasing practices prescribed by the Department of the Interior, are not germane to the issues in this proceeding, even if relevant to competitive structure of the industry generally.

Wilson's Exhibit 33 indicated that the eight largest producers accounted for almost 64 percent of the 1969 new contract volumes in South Louisiana. The factual predicate, however, was untested. Concentration ratios are normally computed on the basis of sales or production data, and additionally, in this industry, consideration might also be given to the ownership of reserves. Consideration should also be given to the gas available for sale from old gas contracts which represents a source of supply as those contracts expire.

Nor was the premise adequately tested that South Louisiana represents a relevant geographic market or that natural gas, to the exclusion of consideration of interfuel substitutability, is a relevant product market. Nor did Wilson comment on any concentration ratios on the buying side of the industry, for even assuming an oligopoly structure among sellers, in a bilateral oligopoly, "the scales are fairly strongly tipped in favor of the buyers"—recognizing that in times of shortage the scales may be tipped the other way.[19] These considerations among others, were not tested, and should have been, at the hearing below. However, Wilson's evidence because of these infirmities, and the rebuttal evidence presented, does not represent substantial evidence upon which the Commission may find that there is an absence of workable competition. On the contrary, Wilson affirmatively testified that there was no factual evidence of any conspiracy or anticompetitive conduct on the part of gas producers.[20]

Witness Sherwin, accepting the factual predicate of Exhibit 33, concluded that the market structure is sufficiently competitive (Tr. 2675–77), and further noted the differences in prices among the several producing areas in relation to points of consumption (Tr. 2810–14). Witness Joe Foster testified that there is marked competition both in obtaining and selling gas reserves (Tr. 2935–36) and that those portions of Exhibit 33 concerning joint ventures are largely irrelevant to competitive considerations (Tr. 2950–56). Witness Rhoads Foster, referring to his testimony in Docket No. AR70–1, likewise found effective competition in the gas producing industry (Tr. 217–18). That witness found workable competition, based on studies performed by other economists (Tr. 228–36).

Whether or not there is workable competition may be relevant to the continued regulation of producers under the Natural Gas Act. The determination of this issue is beyond the scope of this proceeding; in fact, the Commission since *Phillips*[21] has been compelled to regulate producers as natural gas companies. In this regard, Commission policies have been directed at encouraging competition, whether it be placing pipeline production on a parity with independent producers[22] and advance payments by pipelines[23] or exempting small producers from price ceilings.[24]

In summary, the evidence concerning workable competition is irrelevant to a finding of the justness and reasonableness of the rates proposed by the three producers in this case, particularly where, as here, I would affirm a 35¢ cost-based rate from this record. To the extent staff assumed the burden of showing an absence of workable competition, they have failed; substantial evidence does not support the position urged by staff.

JOHN N. NASSIKAS, *Chairman.*

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[19] J. Bain, *Price Theory*, 394–96 (1966); J. McKie, *Tin Cans and Tin Plate* (1959).

[20] E.g. Tr. 2039, "* * * I have no factual information that would indicate the industry has conspired or in any other way contrived a shortage * * *."

[21] *Phillips Petroleum Co.* v. *Wisconsin*, 347 U.S. 672 (1954).

[22] *City of Chicago* v. *F.P.C.*, 458 F. 2d 731 (D.C. Cir. 1971), cert. denied, 405 U.S. 1074 (1972).

[23] *P.S.C. for N.Y.* v. *F.P.C.*, 467 F. 2d 361 (D.C. Cir. 1972).

[24] Order No 428, 45 FPC 454 (1971), reversed, *Texaco* v *F.P.C.*, No. 71–1560, D.C. Cir., December 12, 1972, petition for certiorari pending.

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